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LIQUOR FERRI, PEROXYCHLORIDE OF IRON, DIALYZED IRON, CATALYTIC IRON.

BY EMIL SCHEFFER.

(Read at the February Pharmaceutical Meeting of the Louisville College of Pharmacy.)

The different views regarding the composition of dialyzed iron, of whose preparation a great deal has been written in our periodicals for the last twelve months, induced the writer to make a series of experiments which will no doubt throw some light on the subject and also show the relation of peroxychloride of iron, dialyzed iron and catalytic iron.

By precipitating a solution of ferric chloride with ammonia, the precipitate differs according to the quantity of ammonia used as precipitant. Ammonia added as long as a precipitate is formed yields an oxychloride, and the liquid above the precipitate has *acid* reaction. Ammonia added carefully until the supernatant liquid has become perfectly *neutral* produces a more basic oxychloride. Ammonia added to *excess* yields a precipitate free of chlorine but containing ammonia. Of these three precipitates the two first ones are soluble in water, the third one is insoluble.

In the following experiments 300 cc. of the officinal ferric chloride solution were diluted with water to 1,500 cc., and 150 cc. of this dilute solution were taken for each experiment. The ammonia was also diluted with water, but spec. grav. was not taken, as it was not deemed necessary.

a. To 150 cc. of the dilute ferric chloride solution dilute ammonia was added, in small quantities at a time, to saturation, that is, to the point at which a further addition of ammonia produced a permanent precipitate. To effect this, 81.3 cc. of ammonia were required; the smallest quantity of ammonia added now produces a copious precipitate, and on an addition of 1.7 cc. more, or about two per cent. of

the quantity needed for saturation, all iron was precipitated, while the clear, colorless liquid above the precipitate showed acid reaction.

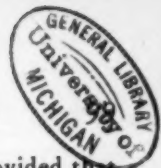
The same experiment was repeated, but to the mixture obtained after the addition of respectively 81.3 and 1.7 cc. of ammonia, ammonia was added to perfect neutralization of the supernatant liquid, 6 cc. being required, making the total of ammonia 89 cc. Although the liquid is perfectly neutral, the precipitate is not pure ferric oxide, but contains still a considerable quantity of chlorine.¹

The precipitate of *a*, washed several times by decantation, until on addition of fresh water it settles slowly and remains suspended for a long time, is then collected on a filter and after thorough draining washed carefully with small quantities of water at a time. The liquid passes through very slow and assumes, after a time, a yellowish color, which becomes deeper yellow by continued washing; the precipitate on the filter changes thereby its appearance, shrinks considerably, and obtains at last a darker brown, almost black, color, and has the consistence of a jelly. When all the precipitate is converted into a black jelly, which in thin layers is transparent and of a deep garnet-red color, the wash water no longer passes through the filter unless a very large quantity is above the precipitate, when it may happen that it dissolves at once, forming a black-red liquid. If the jelly is taken from the filter, a small quantity of water added to it is sufficient to dissolve it entirely after some time. The solution has, in reflected light, a pure black color, dissolves in more water to a transparent deep red solution, is neutral, but still contains ammonium chloride, as the jelly forms before it is all washed out.

A second precipitate, obtained in the same way, was, after draining off the supernatant acid liquid, subjected to dialysis. In the same degree as the acid and ammonium chloride is removed, the precipitate in the dialyzer changes at first into a jelly-like black mass and afterwards into a turbid thick liquid of the consistence of cream. Taken then (after three weeks) from the dialyzer, it dissolves on the addition of a little water, after a few days, to a perfectly clear, thin liquid, of a brownish-black color.

By using more ammonia than is necessary to precipitate the iron,

¹ By calculation it was found that 92.6 cc. of the ammonia were necessary to bind all the hydrochloric acid in 150 cc. of this dilute ferric chloride solution.



precipitates are obtained, which are also soluble in water, provided that ammonia was not added in excess. The more ammonia is used the more basic the precipitates will be; these have the advantage that the ammonium chloride can be more perfectly removed by washing before the precipitates begin to dissolve, which is evidenced by the yellow color of the filtrate, so that they may be washed until the filtrate becomes merely opalescent on addition of silver nitrate, or keeps perfectly clear. It is of the greatest importance that these more basic precipitates be as free as possible from ammonium chloride, since a small quantity prevents their solution. (It is the presence of ammonium chloride, also, that causes the gelatinization of solutions of the less basic oxychlorides.)

These more basic precipitates do not form a jelly after being thoroughly washed, but finally form a thick blackish syrupy liquid, which when taken from the filter gives, on addition of a little water, a very turbid mixture, and, on standing several days, a thin clear liquid, of a brownish-black color, or they only change their color by washing to a somewhat darker but not black hue, without losing much of their bulkiness. This is the case with the precipitates that were removed from a neutral supernatant liquid. After they are washed until the filtrate remains clear on addition of silver nitrate, the precipitates are taken from the filter and transferred with a little water into bottles, so that they can be shaken from time to time. The color of the mixture is then reddish-yellow or reddish-brown, but darkens from day to day as the precipitate enters solution. In the course of several weeks a clear thin liquid, of brown color, is obtained. A temperature of 80° to 85°F. accelerates the solution of the precipitates, while a much higher temperature prevents it.

A few experiments were made by adding to the precipitates, in perfectly neutral liquids, respectively one-half and one per cent. of the ferric solution. Under frequent stirring the mixture was allowed to stand for two days, after which the washing was commenced, and concluded finally on a filter, as above mentioned.

The writer gives below the results of the analyses of different preparations obtained by the above-explained methods, the analyses being made as follows:

The solutions were thoroughly mixed with an excess of pure sodium carbonate and evaporated to dryness. After dissolving the excess of

sodium carbonate and the sodium chloride in water, the filtrate was acidulated with nitric acid, and the amount of chlorine determined with a tenth normal solution of nitrate of silver; the ferric oxide was calcined and weighed.

a. Solution of precipitate obtained with 81.3+1.7 cc. ammonia— $\cdot490 \text{ Fe}_2\text{O}_3 + \cdot061 \text{ Cl} = \cdot441 \text{ Fe}_2\text{O}_3 + \cdot0953 \text{ Fe}_2\text{Cl}_3 = 82.6$ per cent. $\text{Fe}_2\text{O}_3 + 17.4$ per cent. Fe_2Cl_3 .

b. Solution of precipitate obtained with 81.3+three times 1.7 cc. ammonia— $\cdot365 \text{ Fe}_2\text{O}_3 + \cdot0248 \text{ Cl} = \cdot346 \text{ Fe}_2\text{O}_3 + \cdot0385 \text{ Fe}_2\text{Cl}_3 = 90$ per cent. $\text{Fe}_2\text{O}_3 + 10$ per cent. Fe_2Cl_3 .

c. Solution of precipitate obtained with 81.3+four times 1.7 cc. ammonia— $\cdot614 \text{ Fe}_2\text{O}_3 + \cdot0382 \text{ Cl} = \cdot5853 \text{ Fe}_2\text{O}_3 + \cdot0583 \text{ Fe}_2\text{Cl}_3 = 91$ per cent. $\text{Fe}_2\text{O}_3 + 9$ per cent. Fe_2Cl_3 .

d. Solution of precipitate obtained with 81.3+4.5 times 1.7 cc. ammonia— $\cdot411 \text{ Fe}_2\text{O}_3 + \cdot0223 \text{ Cl} = \cdot3942 \text{ Fe}_2\text{O}_3 + \cdot034 \text{ Fe}_2\text{Cl}_3 = 92$ per cent. $\text{Fe}_2\text{O}_3 + 8$ per cent. Fe_2Cl_3 .

e. Solution of precipitate obtained by adding 1 per cent. of ferric chloride solution to the precipitate caused by 89 cc ammonia— $\cdot455 \text{ Fe}_2\text{O}_3 + \cdot0308 \text{ Cl} = \cdot4318 \text{ Fe}_2\text{O}_3 + \cdot047 \text{ Fe}_2\text{Cl}_3 = 90.2$ per cent. $\text{Fe}_2\text{O}_3 + 9.8$ per cent. Fe_2Cl_3 .

f. A precipitate formed by adding to 150 cc. of the ferric chloride solution 91.5 cc. of ammonia, and washed until the filtrate remained perfectly clear on addition of silver nitrate, gave on analysis— $\cdot416 \text{ Fe}_2\text{O}_3 + \cdot00602 \text{ Cl} = \cdot4115 \text{ Fe}_2\text{O}_3 + \cdot00917 \text{ Fe}_2\text{Cl}_3 = 97.83$ per cent. $\text{Fe}_2\text{O}_3 + 2.17$ per cent. Fe_2Cl_3 .

This precipitate was transferred to a bottle, with a little water, and is shaken occasionally. At the date of this paper it has stood a little over seven weeks, during which time over three-fourths of the original precipitate has dissolved. The writer is fully convinced, to judge from its appearance, that it will ultimately dissolve entirely.

g. Another precipitate, obtained with a little more ammonia than f gave— $\cdot424 \text{ Fe}_2\text{O}_3$ and $\cdot00318 \text{ Cl}$.

This precipitate has, at the date of this paper, not shown the least sign of ever dissolving, although it has stood as long and been shaken as often as f.

For comparison, the writer has examined several *commercial* preparations of *dialyzed iron*:

I. $\cdot604 \text{ Fe}_2\text{O}_3 + \cdot0371 \text{ Cl} = \cdot576 \text{ Fe}_2\text{O}_3 + \cdot057 \text{ Fe}_2\text{Cl}_3 = 91$ per cent. $\text{Fe}_2\text{O}_3 + 9$ per cent. Fe_2Cl_3 .

II. $\cdot255 \text{ Fe}_2\text{O}_3 + \cdot01275 \text{ Cl} = \cdot2454 \text{ Fe}_2\text{O}_3 + \cdot01947 \text{ Fe}_2\text{Cl}_3 = 92.6$ per cent. $\text{Fe}_2\text{O}_3 + 7.4$ per cent. Fe_2Cl_3 .

III. $\cdot534 \text{ Fe}_2\text{O}_3 + \cdot0203 \text{ Cl} = \cdot5187 \text{ Fe}_2\text{O}_3 + \cdot031 \text{ Fe}_2\text{Cl}_3 = 94.47$ per cent. $\text{Fe}_2\text{O}_3 + 5.53$ per cent. Fe_2Cl_3 .

IV. $\cdot 274 \text{ Fe}_2\text{O}_3 + \cdot 0125 \text{ Cl} = \cdot 2646 \text{ Fe}_2\text{O}_3 + \cdot 0191 \text{ Fe}_2\text{Cl}^2 = 93\cdot 3 \text{ per cent. Fe}_2\text{O}_3 + 6\cdot 7 \text{ per cent. Fe}_2\text{Cl}_3.$

Dr. Hager's *Liquor ferri peroxychlorati*, which he prepares by dissolving the ferric hydrate obtained from 115 parts of ferric chloride solution in 10 parts of the same ferric chloride solution, contains, when all the ferric hydrate is dissolved, 85 per cent. Fe_2O_3 and 15 per cent. Fe_2Cl_3 . No doubt a more basic preparation could be realized by Dr. Hager's method, that is, by dissolving ferric hydrate in ferric chloride solution, if the ferric hydrate were perfectly pure. But, as his ferric hydrate always contains ammonia, which cannot be removed by washing, this ammonia forms, when the precipitate is added to the ferric chloride solution, ammonium chloride, which sets a limit to the solution of ferric oxide. The basicity of this preparation stands in inverse ratio to the quantity of ammonium chloride in it.

Dr. Wagner, the originator of dialyzed iron, does not communicate the method for making his later preparation, the *catalytic iron*, but asserts that it is not made by dialysis, and that it takes three months to make it. To judge by this, the supposition might not be far from wrong, that it is a solution of a basic oxychloride precipitate, obtained as above explained. The writer could not obtain any of Dr. Wagner's catalytic iron, and therefore cannot say how much chlorine it contains in proportion to the ferric oxide; that it does contain chlorine Dr. Hager has fully proven.

The above experiments teach us that the preparation of a perfectly pure ferric hydrate is very difficult, almost impossible, as in one case it is apt to contain chlorine, in the other ammonia. They prove that the precipitate of oxychloride of iron is soluble in pure water, and that in its more basic combinations it is only soluble when free of saline compounds.

They likewise prove that a solution of very basic oxychloride can be prepared without dialysis, and that the product may be made to contain a less per cent. of chlorine than that found in the best commercial sample of dialyzed iron examined by the writer.

By referring to the precipitate of experiment g, it becomes evident that the solvent power of ferric chloride on ferric hydrate has a limit. This indicates at the same time that a pure ferric hydrate will not dissolve, and that in all the different iron solutions, whether they be called peroxychloride, dialytic or catalytic, the ferric oxide is kept in solution

by ferric chloride. As the proportion of these two ferric compounds can be changed at will, a chemical combination of them cannot be well thought of.

Louisville, February, 1878.

DIALYSIS.

BY RICHARD V. MATTISON, PH.G.

(Read at the Alumni Meeting, February 7.)

It would be a matter of curious interest to know how many times in the past few months the question, What is *dialyzed* iron? what do you mean by *dialyzed*? has been asked and answered; answered in many instances, we fear, in a very unsatisfactory manner, since the explanation of the true meaning of dialysis escapes many because of its very simplicity. It means simply *separation*; a separation which differs from filtration, however, in this respect: that, while the latter is a separation of soluble from insoluble substances, the former is a separation of substances soluble in the same media in common, but differing from each other in their different diffusibility. By diffusibility we mean the power possessed by certain bodies of passing through animal or vegetable membranes. With gases this diffusive power has long been well known, and Graham long ago laid down the rule that "the diffusive power of all gases, simple and compound, varies inversely with the square root of the density of the gas itself."

The diffusive power of solids follows no definite rule. Solids of the same chemical constitution diffuse with the most unequal velocity; for instance, if we make a dense solution of a mixture of sodium and potassium chlorides, and pour carefully on the solution a stratum of distilled water, in a few hours the latter will contain a large proportion of the potassium chloride, but scarcely a trace of the sodium salt. The ammonium chloride diffuses still more rapidly, hence it is readily seen that the rate of diffusion, or, if you will, dialysis, varies without apparent cause. To a certain limit, which is found in practice to average about 5 per cent., differing, however, with different salts, the rate of diffusion increases with the density of the solution, and hence the fact that chemical solutions, *e. g.*, the mixture of ferric chlorides and oxy-chlorides, dialyze rapidly at first, but afterward more slowly.

We are all familiar with the diffusion occurring in the porous cell of

a galvanic battery ; but is it necessary, in order that diffusion shall occur, that the septum or membrane shall be porous? Not in the ordinary acceptation of the term, at least, as diffusion or dialysis takes place most rapidly through structureless basement animal membrane, where, with the most carefully-corrected objective, we are unable with the highest powers of a microscope to differentiate a single stoma ; or, as perhaps a more simple instance, we may take Lhermite's experiment in illustration, viz. : A tube was partly filled with chloroform, upon this was poured a column of water, and above this was placed a column of ether. After standing a short time, the ether had passed entirely through the stratum of water and become mixed with the chloroform. Or again, we can illustrate this diffusion through a non-porous septum by taking a stratum of sulphuric acid in a tube, above it one of water and above this a solution of blue litmus in alcohol. In a short time the litmus will be reddened through the diffusion of the acid into the alcohol. Now, in these experiments it is obvious that water is not in any sense a porous medium, and hence we dismiss any theory having the porosity of membranes as its foundation.

Let us now note the various circumstances that modify or increase this peculiar property, and primarily stands the fact that a liquid to diffuse or dialyze must be capable of "wetting" the interposed membrane ; for, of course, if the liquid is of such nature that it cannot be imbibed by the membrane no dialysis can occur, or if only one liquid is capable of wetting the membrane, then dialysis will only occur in one direction, viz., from this liquid.

Liquids to be proper subjects for dialysis should be perfectly miscible with each other, or if salts, they should be dissolved in a common medium, and of all media water is the best. The solutions should be of different densities, though this is not indispensable, as solutions of different substances of the same density will dialyze perfectly, though with less rapidity.

Again, liquids pass more rapidly through some animal membranes from within outward, than *vice versa*, as, for example, from the interior of a bladder or a stomach outward, the current being always strongest on the side presenting the epithelial surface, but a discussion of this, though exceedingly interesting, is rather a digression from the proper subject of this paper.

The rate of diffusion is accelerated by a moderate increase of temperature, hence dialysis is best performed at a moderate temperature.

To a proper understanding of dialysis, it is important that all idea of chemical action shall be disassociated from it. We have before us a circular on Dialyzed Iron, stating that the mixed solution of ferric chloride and oxychloride, when brought into the dialysator, is decomposed, hydrochloric acid passing through the membrane, leaving behind a solution of ferric hydrate. Of course, this is incorrect, but it is the circulation of just such statements which makes it necessary to disassociate all idea of chemical action from dialysis, as in the instance above quoted the ferric chloride is dialyzed, or in other words, simply separated from the non-dialyzable ferric oxychloride, leaving the latter remaining in the dialysator.

All soluble substances may be divided into two classes, viz., those of high diffusive power, embracing nearly all those crystallizable, which are hence called crystalloids, and those of low diffusive power or non-diffusible, of which albumen is a good example, these being called colloids; these latter are generally amorphous in character.

This may be exemplified by breaking the shell of an egg at one extremity without rupturing the membrane, and inverting it in a wine-glass of distilled water. After a few hours the saline constituents of the egg will have passed through the membrane, while the albumen will be found to have passed through the membrane very slightly, if at all. There is obviously here no chemical reaction; it is evidently simply a separation, or in other words, a true dialysis. When this albumen is acted on by pepsin it is converted into albuminose, which possesses, curiously enough, the property of dialyzing or passing through the membrane with extreme facility.

Boiled starch does not dialyze, while glucose dialyzes very rapidly, hence starchy and albuminoid food cannot dialyze, or in other words, cannot be absorbed until after being digested.

The recently-formed protoplasm passes through the millions of cell walls of the ducts of plants by the law governing dialysis, the differentiated protoplasm remaining to increase the cell walls, and the salts and undifferentiated protoplasm passing through the walls of the cells, which, after all, are only like so many basement structureless membranes.

Salicylic acid is purified by passing through the membrane, the gummy resinous matter, which so tenaciously adheres throughout repeated crystallizations, is mostly removed by dialysis, the pure acid passing through the membrane being separated or dialyzed from the colloid or uncrystallizable contamination.

When the contents of a stomach in cases of medico-legal examinations are placed in a bag of membrane, and this floated in distilled water, the crystalloids (neutral salts, strychnia, corrosive sublimate, etc.) pass through the membrane, while the mucus, albumen, etc., remain behind. Obviously again, there is no chemical reaction here. It is simply a separation, or in other words, a dialysis.

The greater the density of liquids or gases on opposite sides of the membranes the more rapid will be the dialysis. We have all bought the fancifully-colored hydrogen balloons sold on the street corners, and found them, to our dismay, grow smaller day by day, until at last we had only a small rubber bag to console ourselves for the loss of the pretty toy. Here we have by the law of diffusion just as much a true dialysis as we have in the fact that air, upon being drawn into the lung of an animal, diffuses to the most peripheral air vesicle, and the carbon dioxide, by the same law, passes to the external air.

As a summary of the preceding remarks, let us say that dialysis is to be carefully distinguished from filtration, as it is properly the separation by a natural law of substances soluble in a common medium, but possessed of different diffusive power.

RAPID FILTRATION.

BY RICHARD V. MATTISON, PH.G.

(*Read at the Alumni Meeting, February 7, 1878.*)

It is often a matter of considerable annoyance to the pharmacist desirous of dispensing elegant preparations, that no means of filtering cloudy or murky-looking prescriptions are at hand by which this desideratum may be attained in a few moments. It is often desirable to dispense syrups, etc., that are "star bright," and yet be able to do it while the customer is waiting. While a large number of processes and apparatus are suited to the wants of the manufacturer, few if any yet published supply the real want of the dispenser, viz., something for instant use at the prescription counter. To supply this want I have the pleasure of bringing forward to-day the following simple apparatus.

It is presumed every druggist is the possessor of a retort stand; the rings of this are bound with cloth or muslin until the central aperture is of just sufficient size to admit a globe of hard German glass, such as is used for the ordinary student's lamp. The reason we prefer a lamp

globe to an ordinary tube is that it has an enlargement at the base which serves as a shoulder, and thus renders the apparatus more firm.



The tube being now placed in the holder in the same manner as a test tube would be ordinarily placed, the open lower extremity is covered with a piece of filter paper in the following manner, viz.: A circular or square piece of muslin is covered by a similar piece of filter paper, and the two bound firmly over the open lower extremity of the tube with the paper inwards, and secured by means of a rubber band (such a circular rubber ring as is used for umbrellas seems best adapted for this purpose). Should we now fill the tube with liquid it will filter slowly, and we hasten it by fitting a good velvet cork in the upper extremity of the

glass tube or lamp globe, piercing it with a metal tube, and attaching to this an ordinary rubber pipe connected with a bulb, such as are used in the small atomizers or syringes. By compressing the bulb air is forced into the tube, and the increased pressure rapidly increases the flow of filtrate. By this means an ordinary 4 oz. or 8 oz. mixture can be filtered in a very few minutes, and dispensed with satisfaction to the pharmacist and of pleasing appearance to the patient.

This is not offered as entirely new, as the credit of the idea belongs to Messrs. Sykes and Newton, of Hartford, Conn., who have long used a similar apparatus with such evident success as to make their neighbors copy the same.

The apparatus exhibited was manufactured from a lamp globe and an atomizer, the total cost of the same being, without including the retort stand, the sum of 65 cents. Actual use at the laboratory has proved its utility in a small way, and for such purposes it is recommended.

NOTE ON THE TINCTURES OF THE U. S. P.

BY THEODORE G. DAVIS, PH.G.

From observation and experiment, I think it would be preferable in the coming Pharmacopœia to have officinal *Alcohol dilutum* containing 50 per cent. of alcohol, *Alcohol* containing 70 per cent. of anhydrous alcohol and *Alcohol fortior* as at present.

An alcohol of 50 per cent. is preferable in most instances to a weaker spirit, and could be substituted to advantage for the present diluted alcohol, as in most of the tinctures prepared with it there is a cloudiness which becomes clear on the addition of some alcohol; this is particularly noticeable in the tinctures of roots and leaves containing resin and volatile oil. Valerian is a good example, and I can corroborate in every particular the facts set forth by Mr. George W. Kennedy in the February "Journal," in the article on Tincture of Cantharides.

Capsicum, if the percolation is properly conducted, always precipitates a flocculent matter, while floating on the surface is a fatty substance. This may be remedied by a stronger menstruum.

It is my opinion that the tinctures should be more concentrated, and should represent at least one part of the drug in four of the finished product. The menstruum necessary to attain this result is in most instances sufficient to exhaust the drug if the percolation is properly conducted, and I have noticed frequently that the first half of the tinctures are void of sediment, which separates as the weaker solution percolates into it. This is notable in tinctures of the leaves, hence it would seem that more concentrated preparations would be more satisfactory as pharmaceutical preparations, and yet I do not think there is a satisfactory fluid extract in the Pharmacopœia, nor that there is one which represents one grain of the drug in a minim; I do not believe it can be made. Some are very nice when first made, but precipitate the active part (resin or tannin), and become comparatively worthless upon standing, as they must, on our shelves.

Bridgeton, N. J.

EMPLASTRUM PICIS LIQUIDÆ.

BY F. MARION MURRAY, M.D.

Having a call a few days since for a tar plaster, I searched several books of reference for some guide to its preparation, but without avail. Being thrown upon my own resources, I hurriedly melted together 2

parts each of tar and yellow wax, and 1 of Burgundy pitch, and dispensed an unsatisfactory plaster.

Subsequent trials with resin, Burgundy pitch, yellow wax and official lead plaster as "bodies," in various proportions, gave the following results :

Lead plaster an unsightly result, and objectionable because of the different medicinal effect of the "body." Yellow wax, in any considerable proportion, gave unsightly plasters, with diminished adhesiveness. Pitch, in the proportion of 2 parts to 1 of tar, gave a nice looking plaster, but it was rather too adhesive and did not contain enough tar ; it was better replaced by tar's nearest relative, resin. An excellent plaster, and one containing the greatest amount of tar, was made of equal parts of tar and resin. The most satisfactory result was obtained from 2 parts each of tar and resin and 1 of pitch. Melt the resin and pitch together, remove from the fire, add the tar and stir rapidly. Spread on chamois or cloth when it cools to the consistence of honey. Two-fifths of this is the remedial agent ; it is adhesive and elegant.

Philadelphia, Feb. 11th, 1878.

Note by the Editor.—The former Pharmacopœia of Hannover directed this plaster to be prepared from Burgundy pitch 1 part, yellow wax 8 parts, and tar 16 parts. Dorvault's *l'Officine* credits the following formula to Van Mons : Burgundy pitch 8, yellow wax 90, and tar 125 parts.

SOLUBLE MEDICATED BOUGIES.

By C. L. MITCHELL.

Read at the Pharmaceutical Meeting, February 19, 1878.

During the last year considerable attention has been directed to the treatment of urethral diseases by means of soluble medicated bougies. These are, in fact, long, thin suppositories, made of soluble materials and variously medicated, and offer to the physician a ready and convenient method of local medication.

The idea of these bougies is not by any means a new one. Its history is a little obscure, but, so far as I can ascertain, they were first used by Sir Jas. Simpson, of Edinburgh, about twenty years ago, in his practice, and met with success. They were soon afterwards introduced into this country by several of our prominent pharmacists, and

became a method of treatment for gonorrhœa, etc., among some few physicians. The idea of suppositories being then prevalent, they were called urethral suppositories, and moulds were introduced by several manufacturers for their preparation.

They generally were made of cacao butter, and were about 2 to 3 inches in length and $\frac{3}{16}$ inch in diameter, generally tapering to a blunt point. These were used in practice only to a very limited extent, and the matter appears to have slumbered until a few years ago, M. Reynal, a pharmacien of Paris, introduced the "Porte-Remède," as he termed them. They immediately attracted considerable attention from the French physicians, and a number of remarkable cures were made by them in the hospitals of Paris. They were soon after introduced into the United States by Mr. Louis Bock, of New York, and met with considerable sale, their high price, however, being a great obstacle to their general adoption.

Recently, Messrs. J. C. Allan & Co., of Buffalo, have taken a patent for the manufacture of a similar article.

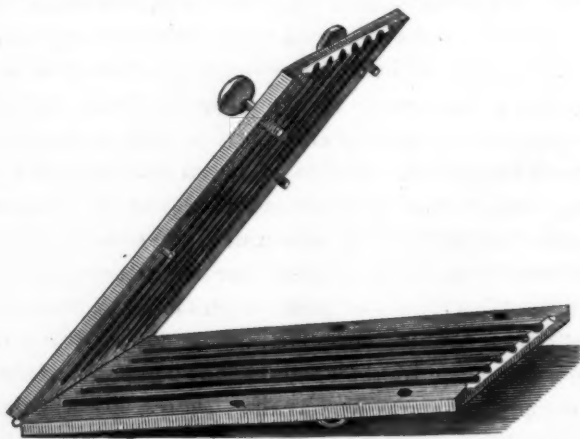
The idea of the treatment of gonorrhœa and gleet by means of these bougies seems to be a good one. It is well known that very few who have occasion to use urethral injections do so with much advantage, and often do more harm than good by their unskillful use of the syringe; so that if a remedy can be obtained which will do away with this objection, a great step will be made in the treatment of these diseases. It is also a well-known fact to all medical men that many cures have been produced by the introducing of a plain metal bougie, or one slightly smeared with some medicated ointment. It would seem to be much better, then, to have a bougie elastic, so as to be easily entered, and made of some suitable material which can be variously medicated, and and at the same time to be slowly soluble by the heat and secretions of the urethra, so as to bring remedial agents in close contact with the diseased parts. It would thus exercise the double action of relieving by causing a distension of the urethra, thus compressing the capillaries and reducing congestion, as well as the curative power which the medicines dissolved in it would exercise. It would also be of service by separating the inflamed surfaces, preventing their adhering and forming strictures, etc.

The "Porte-Remède" of M. Reynal are bougies about $5\frac{1}{2}$ inches long and $\frac{1}{8}$ inch in diameter, very stiff and hard, and indeed quite brit-

tle, although when immersed in water for a time they become flexible. They seem to be composed of molasses and gum arabic or gelatin, and are variously medicated.

The bougies of Messrs. Allan & Co. are claimed by their patent to be made of cacao butter and glycerate of starch, worked into a plastic mass by means of mucilage of gum arabic or tragacanth, this rolled or divided into bongies and coated with gelatin or isinglass by dipping them in a hot solution of the same. They are medicated variously, but generally are put up in the form of a proprietary medicine. They are quite soft and soluble, but are not very flexible, very quickly breaking and mashing up when manipulated for a few moments, and thus offer a considerable objection to their use, as the handling necessary for their introduction is sufficient to destroy them, particularly in warm weather.

About a year ago, I commenced the manufacture of these bougies by a method of my own, using for their composition a mixture of glycerin and gelatin, similar to that mentioned by Prof. Parrish in the "*Am. Jour. Phar.*" for April, 1872, p. 188. The mass made in this manner is suitably medicated, and then while quite hot and liquid poured into moulds, which are represented in the subjoined drawing.



These are made of two plates of brass, hinged together at one end, and with corresponding grooves cut in them so as to make a long, thin cylinder of about the caliber of a No. 8 bougie. When the composition has cooled the bougies are removed from the mould and laid on wooden

trays, which are kept in a dry atmosphere, ranging from 70° to 80°F. , for about two days, when they are scraped to remove any rough edges left by the joints of the moulds, and the rough ends trimmed off. In this manner I have made quite a number of bougies, which have been used by our physicians with considerable success. They will dissolve in water of 100° to 103°F. in from 10 to 15 minutes, and in the urethra in from 1 to 3 hours. They are quite flexible and elastic, being readily tied into a knot and untied again, and do not either break as Reynal's or mash up as Allan's, when handled only becoming more flexible and elastic, resembling the bougies and catheters of elastic hard rubber which have lately come into use. They can be easily introduced into the urethra by either dipping in water or slightly oiling them.

OIL OF WILD CHERRY KERNELS.

BY HERMAN BETZ.

(Read at Alumni Meeting, February 7, 1878.)

This oil is obtained from the kernels of the fruit of *Cerasus serotina*, by hot expression. For several years the kernel of the wild cherry, enclosed in the shell or endocarp, has appeared in quantities in the market, at such a price as to induce manufacturers to express the oil, which may find a use in medicine or the arts. The kernels, together with the shell, are ground to a fine powder, which is carefully dried, and expressed in the cylinder of a hydraulic press at about 2,000 pounds to the square inch. The yield is about 5 per cent.

Although great care is used to avoid all dampness of the powder, the oil has a slight odor of bitter almonds, which, however, is not injurious; the taste is sweetish, agreeable; the color is dark green and is not extracted by water or alcohol, hot or cold. Sp. gr. 0.906. It becomes solid at 15°F. ; the point of ebullition is above the boiling point of mercury; it then takes fire and burns with a yellow flame, leaving a pitch-like residue. Vapors are given off at 280°F. , but are not disagreeable until the temperature reaches 600°F. ; it would for that reason be well adapted for an oil-bath. The oil is insoluble in alcohol, but freely soluble in ether, chloroform, oil of turpentine, olive oil and benzin.

As characteristic may be taken its slight bitter almond odor and high boiling point. It can be distinguished from oil of laurel, which has a

somewhat similar color, by alcohol, which takes up the coloring matter of the latter, and from linseed oil by becoming solid at a much higher temperature.

POISONING BY CHLORATE OF POTASSIUM.

BY GEORGE W. KENNEDY, PH.G.

Read at the Alumni Meeting, February 7, 1878.

A case of poisoning by the above-named chemical occurred in November last, in the family of Dr. Kauffman, of Pine Grove, now of Minersville, Schuylkill county. The case will be interesting, as there is but one on record previous to this where death has resulted by an excessive use of the drug, so far as I am informed—that of Dr. Fountain, of Davenport, Iowa, who took one ounce at a dose, and fell a victim to his temerity. The writer waited on the father of the deceased child, so as to obtain reliable information. I believe that the salt has been considered, both by the medical and pharmaceutical profession generally, as rather an innoxious remedy, comparatively speaking. No doubt to many this case will appear remarkable, and they would rather feel disposed to attach discredit to it, as the writer would feel inclined to regard the fatal result due to some other poison, were he not in possession of such information direct from the father of the deceased child, who is a practicing physician, and stands well in the estimation of the medical fraternity of the county where he resides. Many would hesitate to class chlorate of potassium as a poison, when we take into consideration that it is used in diphtheria and scarlatina in large doses with impunity, and is known in nearly every family, like Epsom salts or magnesia, or any other common drug; in fact, there are few who have suffered with the simplest or more aggravated form of sore throat but are familiar with it as a remedy which for convenience is often kept on hand.

For the reason stated, Dr. Kauffman kept a quantity of the chlorate in a tin box, and at the time of the accident the box contained approximately about four ounces. It was customary with the doctor to give his children, consisting of three (two girls and a boy), a few grains of the salt several times daily, for some time previous, as a prophylactic against diphtheria, as the disease was then prevailing to an alarming extent in a malignant form. On Tuesday morning, Nov. 6th, 1877, between 10 and 11 o'clock, the children were left alone in a room in

the upper portion of the house, playing, while the father and mother were in the lower part, attending to their regular household affairs. The child called Nellie took the tin box from the bureau, containing the chlorate of potassium in the crystalline form, and began playing "Doctor," in imitation of her father. She gave the salt to her brother and sister, and at the same time, as near as can be estimated, ate about half an ounce herself. It is to be wondered at that a child only two and a half years old could eat so much of the salt, as it is anything but pleasant to the taste in such quantities; but being accustomed to its use and in a state of excitement, playing "Doctor," she ate it without observing its taste. Towards the last the children were perfectly quiet, making no alarm until little Nellie began to vomit; but, as the parents had no idea as to the quantity taken, and as no dangerous or serious symptoms were exhibited, and the doctor was not aware of the fatal case of poisoning on record, there was no occasion to feel alarmed. About an hour subsequently the doctor administered diluents freely, with the object of dissolving the salt; the child began to vomit violently, throwing off about one drachm of potassium chlorate, apparently in the same crystalline form as when taken, and continued vomiting until death ensued, about 5.30 P. M., making precisely seven hours from the time the salt was taken. Beside the emetic also hydro-cathartic effects were observed, the child dying of gastritis, or inflammation of the stomach, notwithstanding Dr. Dreher and the father did all in their power to save poor little Nellie.

This case teaches us to be very careful in using chlorate of potassium, keep it out of the reach of children, and even under lock and key; under no circumstances whatever should it be given in the crystalline form, as it seems to be a violent irritant to the mucous membrane of the stomach, and by not being readily soluble (it requires sixteen parts of water, at 60°F.), cannot easily be discharged, as was proven in this case. The child was given as much water and cream as she could drink, and to the last she vomited crystals of the chlorate.

Another peculiarity of the case was the strong inclination of the child to slumber, it being in a lethargic condition from the time it was first noticed until she expired. She gave no indications of pain, but was apparently in a stupor all the time. She had taken no other medicine for months, neither was she laboring under any disease, but was a fine, hearty and well-developed child. There was no other medicine

exposed in the doctor's house, all others being out of reach, so that she could not have taken any other kind.

After the above was written, in conversation with one of our leading physicians, I was informed that he had a patient (a young man, eighteen years old) suffering from sore throat, and chlorate of potassium was prescribed in five-grain doses. From the time the first dose was taken until the medicine was stopped the patient was suffering from gastritis, vomiting freely after each dose. When they ceased administering the medicine the patient recovered from the attack of inflammation of the stomach, thus proving conclusively that the chlorate was the cause of the trouble.

POTASSIUM, SODIUM and AMMONIUM SALICYLATES.

BY NATHAN PENNYPACKER.

Read at the Alumni Meeting, February 7, 1878.

Salicylic acid is dibasic, forming acid and neutral salts; but the neutral compounds with sodium, potassium and ammonium have not yet been obtained, and none but the acid compounds of the other elements were known previous to 1855.¹

The great difficulty in making the compounds of salicylic acid with alkalis is found in the tendency of the solutions to become dark on exposure to air. This can in great part be obviated by mixing a portion of the acid with water, and without the aid of heat, adding the acid potassium or sodium carbonate so long as there is effervescence, or ammonium hydrate in slight excess, evaporating rapidly to dryness, dissolving in alcohol, pouring off the clear liquid, and evaporating it to dryness. The result in every case will be a fine white crystalline powder.

To insure success too long exposure to the air must be avoided, and the liquid must be clarified by decantation rather than by filtration, as by the latter process the solution becomes dark colored, either from exposure or from the organic matter in the filter.

The evaporation must be conducted on a water-bath, as at a higher temperature there is danger of decomposition, with formation of phenol. The advantages claimed for the use of the carbonate instead of

¹ Salicylates of the alkalis were described by Procter and Cahours as early as 1843.—EDITOR.

the hydrate, in the formation of the potassium and sodium compounds, is because the acid can be neutralized with a carbonate, which it is impossible to do with the hydrate, as the product should be acid to test-paper, and if the hydrate is added until neutral there will be an excess of it uncombined. Besides, this does not admit of purification by treating with alcohol which leaves any excess of carbonate undissolved, but takes up the hydrate.

FORMIC ACID.

BY E. GAILLARD, PH.G.

(Read at the Pharmaceutical Meeting, February 17.)

Having occasion to prepare some formic acid for medicinal purpose, I was led to read up the literature on the subject, finding that carbon was its first element, one that helps to make up the great bulk of the vegetable and animal creation, and in connection with hydrogen, oxygen and nitrogen constitutes the organogens, that is organ producers. By a little dexterous manipulation a long series of compounds are formed, adding atom to atom until the numbers that represent their chemical constitution are high among the tens, and even into hundreds. The law of their relation is as clear as that of an arithmetical progression. There exists a series of organic acids of which formic is the first, and to the members of which an atom of carbon and two atoms of hydrogen are added to form the next succeeding in the list.

Formic acid,	. . .	CH_2O_2	Butyric acid,	. . .	$\text{C}_4\text{H}_8\text{O}_2$
Acetic acid,	. . .	$\text{C}_2\text{H}_4\text{O}_2$	Valerianic acid,	. . .	$\text{C}_5\text{H}_{10}\text{O}_2$
Propionic acid,	. . .	$\text{C}_3\text{H}_6\text{O}_2$	Capronic acid,	. . .	$\text{C}_6\text{H}_{12}\text{O}_2$

and so on till we get up to melissic acid, $\text{C}_{30}\text{H}_{60}\text{O}_2$, which bears a resemblance to cerotic acid, $\text{C}_{27}\text{H}_{54}\text{O}_2$, the soluble portion of beeswax.

These and similar are only examples of the slight of hand at which carbon is an expert among the elements, as is likewise evidenced in the following derivatives of starch :

Starch,	. . .	$\text{C}_{12}\text{H}_{20}\text{O}_{10}$	Alcohol,	. . .	$\text{C}_2\text{H}_6\text{O}$
Grape sugar,	. . .	$\text{C}_{12}\text{H}_{24}\text{O}_{12}$	Acetic acid,	. . .	$\text{C}_2\text{H}_4\text{O}_2$

A little water or the hydrogen and oxygen thereof is added to the starch, and we have sugar. Dissolve the sugar, ferment it, and alcohol and carbonic acid are the result. Dilute the alcohol and ferment

again, acetic acid and water make their appearance. This wonderful metamorphosis of these carbon compounds occurs in the cells and tissues of plants and animals. Acetic acid is found in small quantities in juices of plants and animal fluids.

Formic acid exists in red ants, and by making them travel over moistened litmus paper it will redden from the acid secreted by them; hence the name of formic acid from the Latin *Formica*. For preparing the acid the process known as Bertholet's was employed, and proved satisfactory. Oxide of carbon is produced from oxalic acid, and transformed into formic acid under the influence of water.

Place into a retort 250 parts of syrupy glycerin, 38 to 50 parts of water, and 250 parts of oxalic acid; heat up to 100°C. The oxalic acid is destroyed, evolving carbonic acid, while all of the oxide of carbon combines with the elements of water. After ten hours all the oxalic acid is decomposed, and a small quantity of water charged with formic acid has distilled over; the glycerin and the largest part of formic acid remain in the retort. Add 8 parts more water, and distil at the temperature of 120°C., adding water as long as the distillate is acid. The glycerin remains intact, and can be used over. It retains the formic acid from the water, and can be heated without fear.

This acid is colorless, sour and of a pungent taste.

NOTE ON HYDROBROMIC ACID.

BY EDWARD R. SQUIBB, M.D.¹

The potassium salt is, of all the bromides, the most commonly used, and its doses to obtain given effects are best established. Hence if this salt be used as a standard for hydrobromic acid as it is for other bromides, and the acid be adjusted in strength so as to bear some easily remembered relation of its bromine constituent to the potassium salt, a base or starting point would be established for its general and accurate use, whether the bromine, when combined with hydrogen, should prove more active than when combined with potassium or not. Then as the potassium salt contains, in round numbers, say 68 per cent. of bromine, a solution of hydrobromic acid containing also 68 per cent. of bromine would have the same bromine value, though not necessarily

¹ From a paper read before the Medical Society of the State of New York, and communicated by the author.

the same bromine effect in medicine. But an acid of this strength would be unnecessarily difficult to make and to dispense. The next most simple relation is to have an acid of half the bromine strength of the salt, or 34 per cent. Such a strength can be made, kept and dispensed without unusual difficulty, and represents the bromine of the potassium bromide in the proportion of about 2 to 1, a relation easily remembered, and convenient in use. Therefore this strength has been adopted as a proper and convenient one, and the quantity of such an acid equal to the bromine of 20 grains of potassium bromide would be 40 grains, though the equivalent dose might be smaller to produce a given effect, should bromine when combined with hydrogen prove more active than when combined with potassium.

The formula and process for making an acid of this strength are as follows :

Take of Potassium Bromide,	Six parts.
Sulphuric Acid, s. g. at $15.6^{\circ}\text{C.} = 60^{\circ}\text{F.}$ }	Seven parts.
1.838, at $25^{\circ}\text{C.} = 77^{\circ}\text{F.}$ 1.828. }	Nine parts.
Water,	

Add to the sulphuric acid one part of the water and cool the mixture. Then dissolve the potassium bromide in six parts of the water by means of heat, supplying the loss of water by evaporation during the heating. Pour the diluted sulphuric acid slowly into the hot solution with constant stirring, and set the mixture aside for 24 hours that the sulphate of potassium may crystallize. Pour off the liquid into a retort, break up the crystalline mass, transfer it to a funnel, and having drained the crystals, drop slowly upon them two parts of the water so as to displace and wash out the acid liquid. Add the liquid thus drained off and washed out, to that in the retort, and distill the whole nearly to dryness, or until nothing further distills off by moderate heating. The distillate will weigh about ten parts and should contain about 37 per cent. of hydrobromic acid. Assay this by means of normal volumetric solution of soda, and add distilled water until it shall have the strength of 34 per cent. of hydrobromic acid. The product will weigh about eleven parts, and the loss of hydrobromic acid as calculated from the potassium bromide will be about 1.2 per cent.

Solution of hydrobromic acid thus prepared is a limpid, colorless, odorless liquid, having a strongly acid taste. At $15.6^{\circ}\text{C.} = 60^{\circ}\text{F.}$ it has a s. g. of 1.274. At $25^{\circ}\text{C.} = 77^{\circ}\text{F.}$ the s. g. is 1.257 both com-

pared with water at $15.6^{\circ}\text{C.}=60^{\circ}\text{F.}$ It is free from sulphuric acid, or gives but an unimportant trace when tested with solution of baric chloride; and is free from sulphurous acid when tested by its action on pure zinc yielding a gas which does not blacken paper moistened with solution of plumbic acetate. It leaves on evaporation no residue, or but an accidental trace.

It consists of about 33.4 per cent. of bromine, about 0.6 per cent. of hydrogen, and 66 per cent. of water.; or, of 34 per cent. of hydrobromic acid, $\text{HBr}=81$ and 66 per cent. of water. Its formula is $(\text{H}=1+\text{Br}=80=) \text{HBr}=81+\text{Aq.}$

In making this acid on a scale suited to the physician or pharmacist each part in the formula may be represented by 28.35 grams= $\text{1 ounce avoirdupois}$, and the process answers very well upon this scale, yielding about 360 grams= 12.47 ounces .

Tared beakers, a retort about double the capacity of the liquid, with a strip of wire cloth around it where the heating flame is applied, and a small Liebig's condenser, are necessary for this process, and in the distillation here, as indeed everywhere, the lamp flames should be applied to the side of the retort.

If the mixture of sulphuric acid and water be not cooled it causes spattering and loss when poured into the hot solution of the bromide. In dissolving the bromide in an equal weight of water by heating, there is loss of water by evaporation, and unless this loss be made up it will not be practicable to get a perfect solution. But an entirely perfect solution is not essential, provided the undissolved portion be in a finely divided state, for when the diluted sulphuric acid is poured slowly in with stirring any small proportion of the bromide will be dissolved by the additional amount of liquid, and by the stirring. After standing 24 hours the lower part of the vessel will be occupied by a mass of crystals of large size, easily broken up to drain and wash. The quantity of sulphuric acid taken for the process appears disproportionate, being in excess of the quantity necessary to form acid potassium sulphate; but unless such excess be taken the salt will not crystallize out as completely, and then the distillation will be defeated when only about half finished by bumping in the retort. Smaller proportions of acid were successively tried, and when bumping occurred the process was stopped, and the contents of the retort were turned out, cooled and the crystals separated, drained and washed, but this is troublesome

and entirely unnecessary if the larger proportion of acid be used, for then almost the whole of the salt crystallizes out, rendering the process easy when it would be otherwise either troublesome or entirely impracticable. Near the close of the distillation the heat must be kept moderate, because if increased much, sulphuric and sulphurous acids are liable to be distilled over, in considerable quantities. The minute quantities of both which do go over, even in a well managed distillation, are probably thrown over mechanically by the bursting of bubbles on the surface of the boiling liquid. The quantity of either in the distillate of a well managed distillation is but a trace, and so small as to be unimportant. But should it be desired to have the distillate entirely free from these acids, a very small quantity of barium hydrate must be added and the whole be re-distilled. In the distillation the hydrobromic acid comes over comparatively weak at first, the strength gradually increasing to about 47 per cent., hence the distillate should be well stirred before being tested or assayed.

In testing for sulphurous acid it is only necessary to put a small piece of pure zinc into a test tube, pour upon it a few drops of the acid, push into the upper part a loose wad of cotton wool, and lay the paper moistened with solution of plumbic acetate on to the cotton wool.

The assays and adjustment of strength are conveniently and easily made as follows: The atomic weight of HBr being 81, a half of the tenth part of this number, namely, 4.05 grams, is weighed off, and normal sodium solution is dropped into it from a burette to the point of saturation as ascertained by means of a small piece of litmus paper kept floating in the acid as it is stirred during the dropping in of the volumetric sodium solution. Usually 18 to 19 cc. of the volumetric solution is required for saturation. Then, as only half of 8.1 grams was taken for the assay, this reading from the burette must be doubled, and therefore indicates 36 to 38 per cent. as the strength. Then weigh the distillate again, and add to it 5 per cent. of its weight of its distilled water and again assay it as before. By calculation from the quantity of water used to reduce it to this new strength, the additional quantity of water necessary to reduce it to the 34 per cent. required is easily found. When this shall have been added, and the whole well stirred, a final assay should be made to verify the result.

This acid, in common with all the others, should be dispensed by

weight. A troyounce of it contains almost exactly 400 minims ($401.48+$), and the fluidounce, of 480 minims, weighs almost exactly 574 grains ($573.86+$). A drachm of it, therefore, would contain 50 minims, and would be the bromine equivalent of 30 grains of potassium bromide. A gram of the acid is equal to 12.86 minims, and therefore 4 grams would be 51.44 minims, equal to 30.86 grains of the potassium bromide, a very large sedative dose.

The acid is not very easily administered in full doses in consequence of the large dilution necessary, and the disagreeable effect of "setting the teeth on edge." A dose of 50 grains, equal to 41.66 minims, and to 25 grains of potassium bromide, requires not less than 8 fluidounces of dilution, and the dilution must contain not less than an ounce of sugar or two ounces of syrup, to make it easily drinkable. This will be found to be the principal drawback to the use of the acid, unless it shall be proved to be effective in smaller quantities than its equivalence to the bromides indicates. And this effectiveness in much smaller doses is not only probable, but almost certain, if the experience of Fothergill and others may be trusted, since they give it in doses of one-eighth to one-fourth of those here indicated as being the bromine equivalent of potassium bromide. That is to say, the doses advised by those who appear to have used it with the best effects are equivalent to about 6 to 8 grains of potassium bromide. This published experience would make the average dose of the acid here described, say about 12 to 16 grains, or the bromine equivalent of only 6 to 8 grains of potassium bromide. In the very limited experience of physicians around the writer these doses are too small, and 20 to 30 grains, equal to 10 to 15 grains of potassium bromide are needed for a prompt sedative effect, while 40 to 50 grain doses are not uncommon; and such doses have to be repeated at times in controlling the headache, etc., of quinism. Even such doses require a dilution of 2 to 4 fluidounces of water for easy administration.

If 60 grains=50 minims of the acid here described be added to 1140 grains of syrup the mixture will measure 2 fluidounces, and weigh ($60+1140=$) 1,200 grains. Each 75 grains of this, 1 fluidrachm, will contain 4 grains nearly, or a little more than 3 minims of the acid; and 4 fluidrachms of this, equal to 15 grains of the acid when diluted with ice water to 2 to 4 fluidounces makes a dose which is easily adminis-

tered and probably effective. Such a dose is equal to 12.5 grains of potassium bromide.

Besides the administration of single doses for temporary sedative effect, it will, however, doubtless come into occasional use for a more prolonged and permanent effect as a partial substitute or alternate for the bromides to correct or prevent alkaline saturation. The doses for such continuous uses do not seem to have been ascertained, for no instance of bromism from its use has been published so far as this writer has seen. Therefore, as bromism must be the test of effective quantity the doses must be considered as unsettled. If the bromine, as present in this acid, should prove capable of producing bromism in much smaller quantity than that present in the bromides, as seems to be foreshadowed in its use up to this time, then an important advantage will have been gained, and the doses of the acid will be correspondingly smaller. At present it appears that for continuous use as a substitute for the bromides, to be continued through several weeks or until the bromides can be resumed, doses of 20 to 30 grains might be sufficient. It may also be found that by adding smaller quantities of the acid to reduced doses of the bromides the alkaline saturation might be postponed or avoided. For example, where an epileptic may be taking 25 grains of potassium bromide three or four times a day, it may, and probably will, be found that the dose of bromide can be reduced to 20 grains or less by adding one, two or three grains of this acid to the smaller dose. Such uses as this for the acid are well worth careful trial, and in such quantities it can be easily administered.

The acid will also undoubtedly prove very useful for making solutions of various bromides extemporaneously. For example, lithium bromide should, by its composition, be very useful in medicine, as the salt contains nearly 90 per cent. of bromine, or more bromine and less base than any other neutral salt possible. This is easily made, simply by saturating the acid with lithium carbonate, and adjusting the volume of the solution to the dose required.

Many formulas have been published for making this acid for medicinal uses, but all so faulty and inaccurate or so difficult as to be impracticable for ordinary use where any moderate degree of precision in medication is required.

That of Forthergill was among the earliest, and has been by far the most used. It is given in his "Handbook of Treatment," Amer.

edition of 1877, p. 569. The formula is loose and inaccurate, containing a considerable excess (161 grains) of potassium bromide. Its quantitative defects are easily remedied, but it yields a complex solution containing much tartaric acid and potassium, and is otherwise objectionable, having all the faults of the process upon which it is modelled, namely, the process for hydriodic acid by Buchanan, of Glasgow. Made by Fothergill's formula it will commonly contain between 8 and 9 per cent. of the hydrobromic acid, and as the dose is stated at "3ss. to zi," if this be by weight as it is written, it will be equivalent to 4 to 8 grains of potassium bromide only.

Fothergill's process was very much improved by Mr. Charles Rice; see "New Remedies" for April 16, 1877, p. 107. But this preparation, though much more definite, is still liable to the objection of containing much tartaric acid and potassium, and therefore of being difficult to identify or verify, or to discriminate by tests or by assay.

Much better results are obtained by the original process of Balard, particularly as modified by Prof. J. M. Maisch. See "Proceedings of The Amer. Pharm. Asso." for 1860, p. 220, or as still farther modified by Prof. G. F. H. Markoe, see "Proceedings of The Amer. Pharm. Asso." for 1875, p. 686. But these and many other published processes are less simple and easy than that here proposed.

That here given is not original with the writer, but is alluded to in all standard works on chemistry; but, without the variation in quantity of sulphuric acid used, and without crystallizing out the potassium sulphate before the distillation, the process is impracticable, or at least has always proved to be so in the writer's hands, and in the hands of all whom he has known to have tried it.

Brooklyn, Jan. 12, 1878.

ON THE VERATRUM ALKALOIDS.

BY ALEXANDER, TOBIEN.¹

This interesting essay, of which we can publish only a brief abstract, opens with a historical introduction citing the literature of the chemical investigations made with different species of *veratrum*. The poisonous properties of *veratrum album* were known in Spain in the

¹ *Beiträge zur Kenntniss der Veratrum Alkaloide. Inaugural-Dissertation. Dorpat, 1877, 8vo, pp. 38. Communicated by the author.*

sixteenth century, the rhizome being called *de balestera* or *de jervia*, and it is possible that the *charbak abjadh* of the Arabian physicians was the same drug. Since veratrum is not indigenous to Greece, the helleboros of the ancient Greeks was most likely not identical with the former.

Pelletier and Caventou examined *Ver. album* in 1819, and announced the presence of veratria. In 1837, Edward Simon corroborated the presence of veratria, and found another alkaloid which he called *barytin* (from its behavior to sulphuric acid), changing the name afterwards to *jervia*. H. Will ("Ann. der Phar." xxv.) examined *jervia*, and from his elementary analysis gave it the formula $C_{60}H_{45}N_2O_8$, which was changed by Limpricht ("Grundriss d. Org. Chem.," 1862) to $C_{60}H_{45}N_2O_6$. In 1842 A. Weigand confirmed the presence of veratria and *jervia* in *Ver. album*. The same results were arrived at by Herm. Weppen, in 1872, and in the same year Schroff, Jr., announced the presence of veratria in *Ver. Lobelianum*, while Dragendorff, in 1871, found the second alkaloid (beside *jervia*) to differ from veratria, and subsequently announced the presence of *jervia* also in *Ver. nigrum*.¹

The author first examined the rhizomes of *Ver. Lobelianum*, partly collected from wild plants in Austria, partly from cultivated ones in Russia, in both of which Dragendorff had already found notable quantities of veratroidia. The process adopted was as follows:

Two kilos of the coarsely powdered rhizome were mixed to a soft mass with sufficient water containing 36.8 grm. phosphoric acid, sp gr. 1.23, macerated for 24 hours, mixed with 7.5 kilos alcohol of 95 per cent., the mixture digested in a water bath for 8 hours, cooled and expressed; and the press cake similarly treated with 12 kilos alcohol of 70 per cent. and 15 grams phosphoric acid. The united liquids were filtered, the alcohol distilled off in vacuo, the residue concentrated to a syrupy consistence, mixed with 3 times its weight of water, the resin filtered off after several hours and the filtrate rendered alkaline by sodium carbonate. The precipitate was separated from inorganic salts by solution in alcohol, the filtrate diluted with an equal part of water, digested with recently ignited animal charcoal, and the faintly wine-yellow filtrate evaporated, when a yellowish crystalline mass, *A*, was

¹ The literature on the investigation of *Ver. viride* is given in full. We omit it here, since our readers are familiar with it from the papers of Ch. L. Mitchell ("Proc. Am. Phar. Assoc.," 1874), Chas. Bullock ("Amer. Jour. Phar.," 1875, p. 449) and Prof. Wormley ("Ibid.," 1876, p. 1).

left. The alkaline filtrate from the above precipitate was agitated with chloroform, this solution separated and the chloroform evaporated, leaving an amorphous light-yellowish residue, *B*.

A proved to be jervia, containing some veratroidia, while *B* was a mixture of veratroidia with some jervia. *A* was dissolved in dilute acetic acid, filtered and mixed with dilute sulphuric acid until a distinct turbidity appeared. The yellowish-white granular precipitate, collected after several hours, was jervia sulphate not yet quite pure. The filtrate was rendered alkaline by ammonia and agitated with chloroform which left but a slight amorphous pale-yellow residue.

B was contaminated with wax, and contained so little jervia that its solution in acetic acid gave no precipitate with sulphuric acid; through an accident it was lost.

The resin collected as above from the concentrated liquid, after dilution with water, still contained alkaloid. To obtain this, Bullock's method ("Amer. Jour. Phar.," 1876, p. 147) was tried with indifferent success. The powdered resin now mixed with an equal weight of lime, enough water was added to produce a soft mass, and this dried at 40°C (104°F.) From the powdered lime resin soap the alkaloid could be extracted with ether, but hot 85 per cent. alcohol was also found serviceable. The alcohol was partly distilled off, then dilute acetic acid added and all alcohol evaporated; the filtrate was treated with sodium carbonate, the precipitate *C* washed, freed from lime by dissolving in alcohol, and this solution evaporated.

The alkaline filtrate from *C* was agitated with chloroform, which, on evaporation, left an amorphous light-colored residue, consisting of veratroidia with a little jervia.

C, consisting of veratroidia with larger quantities of jervia, was dissolved in dilute acetic acid, the solution divided into three parts, which were precipitated respectively with muriatic acid, sp. gr. 1.2, nitric acid, sp. gr. 1.13 and diluted sulphuric acid (1 to 7 water). The filtrates were mixed and marked *D*, the brown-red soft granular precipitates were, after Bullock's recommendation, freed from resin with 95 per cent. alcohol, and the residue dissolved in boiling strong alcohol, previously diluted with an equal part of water. The filtered solutions left on spontaneous evaporation, crystals agreeing with those figured by Bullock and by Wormley (*loc. cit.*)

Pure jervia was obtained from the nitrate by treating it with a warm

solution of sodium carbonate, and purifying the alkaloid with strong alcohol, when it formed perfectly white needles, which, by ultimate analysis gave results, leading to the formula $C_{13}H_{23}NO_4$, or more closely to $C_{27}H_{47}N_2O_8$ ($O=16$). The sulphate and hydrochlorate have the composition $C_{27}H_{47}N_2O_8, H_2SO_4$ and $C_{27}H_{47}N_2O_8, HCl$.

The acid filtrate *D* was precipitated with sodium carbonate, and the precipitate freed from jervia, as recommended by Bullock, by dissolving in acetic acid, and treating with potassium nitrate; the filtrate was rendered alkaline by sodium carbonate and agitated with chloroform; a small quantity of light yellow amorphous veratroidia was obtained, having the following reactions:

Concentrated sulphuric acid gave a yellow solution, passing through light brown-red into deep raspberry red.

Concentrated muriatic acid yielded a light yellowish rose-red solution, which, on heating, became dirty yellow, and with sulphuric acid and heating brown-red.

Concentrated nitric acid produced a light yellow solution, which, with sulphuric acid and on being heated, turned transiently orange red and passed into lemon-yellow.

The author observed that small quantities of veratroidia, also of veratria, will materially modify the reaction of jervia, and commercial jervia seems often to contain one or both of these alkaloids. Veratroidia is dissolved by cold concentrated muriatic acid with a pale rose-red color, which, when heated, is rapidly discolored. Veratria, on the contrary, dissolves in cold muriatic acid colorless, an intense and lasting red coloration being produced by heat, and this is likewise the case with sabatrina and sabadillia.

Veratroidia is rather freely soluble in water, freely in alcohol, ether and chloroform, little in petroleum ether (gasolin), somewhat more in benzin and amylic alcohol. It dissolves in water to about the same extent as sabadillia, less than sabatrina and more freely than veratria; it differs from sabadillia by its greater solubility in ether.

The two alkaloids, jervia and veratroidia, were also found in cultivated old and recent rhizomes, and in the young leaves of *Veratrum Lobelianum*, and in the dried rhizome of *Ver. album*, which yielded little jervia and more veratroidia.

Jervia is very sparingly soluble in water and in solution of sodium carbonate, freely in alcohol and in chloroform, less in amylic alcohol

and benzin, very little in ether and almost insoluble in petroleum. When pure it is dissolved by concentrated sulphuric acid with a yellow and finally light-green color. Concentrated muriatic and nitric acids cause no change in the color; but muriate of jervia, thrown into concentrated nitric acid, produced an evanescent rose color. Potassium nitrate indicates jervia already when in dilution of one in 1200.

The elementary analyses of veratroidia points to the formula $C_{51}H_{78}N_2O_{16}$ or $C_{24}H_{37}NO_7$. Its action upon frogs is similar to veratria, but much more energetic than either sabadillia or sabatrina.

The composition of the above alkaloids, as ascertained by Weigelin and Tobien, is the following:

Veratria,	$C_{52}H_{86}N_2O_{15}$, <i>W.</i>	Sabatrina,	$C_{51}H_{86}N_2O_{17}$, <i>W.</i>
Veratroidia,	$C_{51}H_{78}N_2O_{16}$,	Sabadillia,	$C_{41}H_{66}N_2O_{13}$, <i>W.</i>
or	$C_{24}H_{37}NO_7$, <i>T.</i>	Jervia,	$C_{37}H_{47}N_2O_8$, <i>T.</i>

Even if the molecular values of the formulas should, on further investigation, be altered, this is evidently a natural group of alkaloids, somewhat similar to those of opium and cinchona. The first four show a great similarity in their behavior to sulphuric acid; but with sugar and sulphuric acid, pure veratria yields a green, afterwards blue coloration, while veratroidia gives a black-brown color, which lasts for some time.

Veratria, sabatrina and sabadillia agree in their behavior to muriatic acid; but veratroidia and jervia differ very widely from it. In their action veratria, veratroidia and perhaps jervia are nearest related to each other; but the latter is distinctly characterized by its behavior to sulphuric, muriatic and nitric acids.

M.

FERRUM ALBUMINATUM SOLUTUM.¹

BY C. BERNBECK.

Dr. Triese, of Illingen, near Saarbrücken, has added a very valuable and therapeutically important preparation to the *Materia Medica* by publishing a formula for the preparation of *Ferrum albuminatum* in the "*Berliner Klinische Wochenschrift*." His formula reads as follows: Mix the white of an egg intimately with 10 grm. liq. ferri sesquichlorati by triturating them in a mortar; remove the excess of chlo-

¹ Translated by L. v. Cotzhausen from "*Archiv der Pharmacie*," Dec., 1877.

ride of iron by washing with distilled water, and redissolve, by macerating for two days, the precipitate in half a liter of distilled water, previously acidulated with 12 drops of pure hydrochloric acid.

Numerous experiments made by me proved that only in the following manner, by carefully avoiding an excess of hydrochloric acid in the ferric chloride, a preparation may be obtained answering to the description given by Dr. Triese. It is well known that the officinal liquor nearly always contains an excess of hydrochloric acid, which in the preparation of ferrum albuminatum will cause a solution of the greater portion of the precipitate, which will then necessarily go to waste by washing. This loss is avoided by using a neutral ferric chloride obtained in the following manner: Dissolve 6 parts of dry ferric chloride obtained by evaporating the officinal liq. ferri sesquichlorati, in 10 parts of distilled water, filter and mix the filtrate intimately with 20 parts of the white of eggs; place the brownish-yellow magma on a moistened strainer, press well with the hands and repeat it several times, after the addition of a little distilled water, until the excess of chloride of iron is removed. Dissolve the residue in $\frac{1}{2}$ liter of distilled water, acidulated with 12 drops of hydrochloric acid, by macerating for one or two days, and filter.

Dr. Triese administers this preparation in chlorosis without the addition of phosphorated ether; it must, then, always be freshly prepared. As a remedy for rhachitis he prescribes an addition of 12 drops of a solution of 0.05 grm. phosphorus in 30 grm. of ether to 250 grm. of the iron albuminate solution, which keeps the latter unaltered for at least six weeks, and permits it to be kept on hand for that length of time.

ON THE ORIGIN OF TRAGACANTH.¹

BY M. GIRAUD.

The formation of gum in plants seems to depend upon a peculiar morbid condition, the main phases of which were investigated and described by Trécul in 1860. Although he studied the formation of gum only in the Rosaceæ, it has been taken for granted that a similar process yields the gum of the Acaciæ, which, being an article of commerce, is of much greater importance. The gum-disease is caused by a fullness of sap in the young tissues, whereby the new cells are softened

¹ Translated from "Archiv d. Phar.," Dec., 1877, by L. v. Cotzhausen.

and finally disorganized. Thus cavities are formed filled with liquid containing the fragments of the destroyed tissues. The cavities gradually increase in size in consequence of the disintegration of the neighboring cells, and whenever they occur near the epidermal layers they may force an opening through them, and thus cause larger or smaller fissures; but if they remain enclosed on all sides they become receptacles of gum. This gum near the walls of the cavity appears in the shape of gelatinous warts, which grow, turn yellow or brown, and finally fill up the hollow space. When near fibres, it appears first to exude from them, and gradually to alter them together with their contents. If the cavities occur near the bark, or near soft woody tissue, their contents occur in the well-known shape of transparent tears.

This is the origin of the gums in the *Rosaceæ* and *Acaciæ*, which consist mainly of gummic or metagummic acid. Tragacanth differs from these gums both in its origin and properties. Hugo v. Mohl considers it likewise as a pathological product, having some similarity with the other gums, and to be the result of a more or less complete transformation of the cells of the pith and of the medullary rays, into a gelatinous substance, which swells by the imbibition of water to several hundred times the size of the original cells. On examining the anatomical structure of the *Astragali* furnishing this substance we find that the pith and medullary rays have changed more or less and all the intermediate stages in this gradual transformation are observable. The cells, which originally assumed a hard, horny consistence, without altering their shape, ultimately condense into a homogeneous mass, in which the cell walls are no longer perceptible. This seemed to confirm the opinion of Guibourt, that the soluble portion of tragacanth consists of arabin and the insoluble portion of a mixture of cellulose and starch, both partly altered. But this view is as little exact as the statement generally met with in the books, that the soluble portion differs from arabin in not being thickened by ferric salts, and that after precipitation by alcohol it possesses a peculiar mucilaginous consistence. The portion insoluble in hot water was called bassorin, and stated to have the general constitution of amylaceous substances, to differ greatly from cellulose, and to be characterized by swelling greatly in water.

Guibourt mentions starch as a constituent and others have observed the same, and that vermiform tragacanth contains more than the flakes; the manner in which tragacanth forms, according to Mohl, would

easily explain the presence of starch. But, evidently, if the recognition of such an easily recognizable body has been so difficult, it is even more so to recognize the nature of the main constituent which imparts to tragacanth its principal properties. Indeed, much confusion has existed on this point, and we are therefore the more rejoiced at meeting with researches by Giraud, by which an unexpected light is shed on it.

If, says the author, 1 part of tragacanth is digested in 50 parts of water, containing 1 per cent. of hydrochloric acid, the liquid filtered and then mixed with baryta water in excess, the gradually deposited precipitate will consist of pectate of barium. If this is collected, washed, diffused in water and then treated with muriatic or acetic acid, the base will dissolve, while the residue will consist of pectic acid. In this manner tragacanth will yield 60 per cent. of pectic acid. The process described shows plainly that pectic acid does not pre-exist in tragacanth, but is formed from some other substance. Giraud explains as follows:

1. A very small percentage of tragacanth only is soluble in cold water, not 30 to 50 per cent., as is sometimes stated. The soluble portion is not a substance similar to arabin, but a mixture.

2. If tragacanth is digested, in a water-bath, with 50 times its weight of water, the entire gummy constituent is transformed into a soluble gum, which after having been dried will not swell. The new product is not arabin, but pectin.

3. By subjecting this principle, with water containing 1 per cent. of acid, to the heat of a water-bath for two or three hours, it becomes entirely soluble, but still consists mainly of pectin, and, though precipitated by alcohol, is not gum, as usually stated. Sugar, formed simultaneously, amounts to scarcely one-tenth of the substance employed.

These experiments show that tragacanth is transformed by these processes into pectin, which is soluble in water, precipitated by alcohol, and by alkalis converted into pectates and metapectates. The pectin is generated from an insoluble pectinous principle, which constitutes more than one-half of the tragacanth, and is apparently identical with Frémy's pectose.

It is well known that pectose occurs largely in the tissues of many fruits and roots; it accompanies, nearly always, cellulose, with which, however, it cannot be confounded; for by the action of acids cellulose

is transformed first into dextrin and afterwards into sugar, but never into pectin.

Giraud's observations, it will be seen, contradict Mohl's views, according to which the cellulose of the *Astragali* is transformed into tragacanth.

The author has found tragacanth to have the following average composition: 20 water, 60 pectinous principle, 8 to 10 soluble gum, 3 cellulose, 2 to 3 starch, 3 per cent. of mineral constituents and traces of nitrogenated matter.

SCHEME for the RECOGNITION of the more Important RESINS, GUM RESINS and BALSAMS.¹

BY EDWARD HIRSCHSOHN.

In continuation of the author's researches on ammoniacum, galbanum, sagapenum and opoponax, previously published, he has made a comparative examination of a large number of the more important resins, gum resins and balsams. The results have been published in an inaugural dissertation written upon attaining the grade of "magister der pharmacie." This thesis contains a table for the recognition of these substances by their behavior towards reagents. The following are the reagents used:

1. Sulphuric acid, sp. gr. 1.820.
2. Alcoholic hydrochloric acid, obtained by saturating 95 per cent. alcohol with dry hydrochloric acid gas.
3. Bromine solution, 1 part of bromine in 20 parts of chloroform.
4. Saturated solution of chloride of lime in distilled water at the ordinary temperature.
5. Alcoholic solution of perchloride of iron, 1 part in 10 parts of 95 per cent. alcohol.
6. Saturated solution of neutral lead acetate in 95 per cent. alcohol.
7. Solution of ammonia, sp. gr. 980.
8. Solution of pure sodium carbonate crystals in distilled water.
9. Fröhde's test: 1 centigram of sodium molybdate in 1 cc. sulphuric acid.
10. Impure chloral hydrate, containing alcoholate.
11. Saturated solution of iodine in petroleum spirit boiling at 60°C.

COMPLETELY SOLUBLE IN CHLOROFORM.

COMPLETELY SOLUBLE IN ETHER.

Ethereal solution becomes turbid after addition of alcohol.

- I. Alcoholic solution gives with perchloride of iron a turbidity that disappears on boiling. Chloral reagent colors violet—Canada Balsam.
- II. Alcoholic solution gives no turbidity with perchloride of iron.
 1. The drug is liquid and forms a clear mixture with petroleum spirit boiling below 40° C.
 - a. Bromine solution colors the chloroform solution yellowish, then violet and blue—Maranha Copaiba Balsam.

¹ "Pharmaceutische Zeitschrift für Russland," xvi, 81.

- b. Bromine solution produces no color—Para Copaiba Balsam.
2. The drug is solid and dissolves only partially in petroleum spirit. Iodine solution colors red-violet—Ordinary Mastic.

Ethereal solution forms clear mixture with alcohol.

I. Perfectly soluble in alcohol.

1. Perchloride of iron colors the alcoholic solution blue.
 - a. Lead acetate gives a precipitate with alcoholic solution. Sulphuric acid dissolves the drug with a cherry-red color—Guaiacum Resin.
 - b. Lead acetate gives no precipitate. Sulphuric acid dissolves the drug with a yellow-brown color—Carana Resin (*Aceyta americana*).
2. Perchloride of iron colors the alcoholic solution brownish or greenish.
 - a. Lead acetate gives with the alcoholic solution a precipitate that is not dissolved by boiling.
 - α. Sodium carbonate solution dissolves parts at the ordinary temperature. Chloral test colors the residue from the evaporation of a petroleum spirit extract gradually red-violet with blue streaks—Coniferous Balsams and Resins.
 - β. Sodium carbonate dissolves none or a very small quantity.
 - A. Petroleum spirit extract colorless. Chloral test produces no color or a very faint greenish—Bombay Mastic.
 - B. Petroleum extract colored.
 - C. Dark brown. Chloral test colors brown—Mani Resin.
 - D. Yellow-brown. Chloral test colors gradually indistinct red violet—Carana Resin.
 - E. Yellow-brown. Chloral test and bromine solution color a magnificent violet—Carana hedionda.
 - b. Lead acetate gives with alcoholic solution a precipitate that dissolves on boiling.
 - α. Bromine solution colors red—Peruvian Guaiacum Resin.
 - β. Bromine solution produces no coloration—Alexandrian Mastic.
 - c. Lead acetate gives no precipitate. Ammonia gives a turbid mixture—Dragon's blood.

II. Imperfectly soluble in alcohol.

1. Lead acetate produces turbidity which disappears upon warming—Brazilian Copaiba Balsam.
2. Lead acetate gives no precipitate. The drug is clearly crystalline. Sodium carbonate does not dissolve it by boiling.
 - a. Bromine solution gradually colors green.
 - A. Alcoholic hydrochloric acid colors violet, blue or brown—Elemi.
 - b. Bromine solution colors violet—Elemi.
 - c. Bromine solution produces no color—Elemi (*Amyris elemifera*).

IMPERFECTLY SOLUBLE IN ETHER.

Perfectly soluble in alcohol.

- I. Sulphuric acid colors the residue from evaporation of a petroleum spirit extract cherry-red. The drug is free from cinnamic acid—Siam Benzoin.
- II. Sulphuric acid does not color such residue, or only faintly brown. Contains tains cinnamic acid—Sumatra Benzoin or Tolu Balsam.
- III. Sulphuric acid colors such residue yellow-brown passing into violet—Black Peru Balsam.

Imperfectly soluble in alcohol.

- I. Perchloride of iron gives a precipitate, which is neither dissolved by boiling nor soluble in ether—Brazilian Copal.
- II. Perchloride of iron produces no turbidity or only a slight one that disappears on boiling.
 1. The ethereal solution gives with alcohol a turbid mixture.

- a. Alcoholic hydrochloric acid colors it brownish. Chloral test colors evaporation residue of petroleum spirit extract greenish—Dammar.
- b. Alcoholic hydrochloric acid colors it brick-red. Chloral test colors the petroleum spirit residue carmine-red to violet—White Peru Balsam.
- 2. Ethereal solution gives with alcohol a clear mixture.
 - a. Ammonia gives with alcoholic solution a clear mixture. Bromine solution colors blue—Ceraia Resin.
 - b. Ammonia gives with the alcoholic solution a turbid mixture. Bromine solution colors greenish—Mecca Balsam.

IMPERFECTLY SOLUBLE OR INSOLUBLE IN CHLOROFORM.

COMPLETELY SOLUBLE IN ETHER.

Ethereal solution red. Ammonia gives with alcoholic solution a clear mixture—Dragon's Blood from Pterocarpus Draco.

Ethereal solution yellowish or colorless.

- I. Alcoholic solution gives with lead acetate no precipitate—Podocarpus Resin.
- II. Alcoholic solution gives with lead acetate a precipitate that is not dissolved by boiling—Sandarac.

IMPERFECTLY SOLUBLE IN ETHER.

Ethereal solution becomes turbid after addition of alcohol.

- I. Alcoholic solution gives with ammonia a clear mixture.
 - 1. The mixture with ammonia is yellow. The solution of the resin in sulphuric acid is yellow-brown and gives with alcohol a clear violet mixture—Eryops Resin.
 - 2. The mixture with ammonia is carmine red—Sonora Lac.
- II. Alcoholic solution gives with ammonia a turbid mixture.
 - 1. Perchloride of iron colors green. The drug contains cinnamic acid. Lead acetate gives a precipitate—Liquid Storax.
 - 2. Perchloride of iron colors brownish or not at all.
 - a. The drug contains cinnamic acid, and gives with lead acetate no precipitate—Liquidambar Balsam.
 - b. The drug contains no cinnamic acid, and gives with lead acetate a precipitate—Euphorbia Tirocalli Resin.

Ethereal solution gives with alcohol a clear mixture.

- I. Perfectly soluble in alcohol. Perchloride of iron colors dark brown or black.
 - 1. Solution in alcohol is red.
 - a. Lead acetate gives no precipitate. Chloroform extract colorless—Xanthorrhæa quadrangularis Resin.
 - b. Lead acetate produces turbidity. Chloroform extract yellow—Xanthorrhæa arborea Resin.
 - 2. Alcoholic solution yellow. Lead acetate produces a precipitate—Yellow Xanthorrhæa Resin.
- II. Imperfectly soluble in alcohol.
 - 1. Alcoholic solution gives with ammonia a clear mixture.
 - a. Ammoniacal mixture is violet. Lead acetate gives a violet precipitate—Lac.
 - b. Ammoniacal mixture is yellow or colorless
 - a. Perchloride of iron colors the alcoholic extract black. Lead acetate gives no precipitate—Gamboge.
 - β. Perchloride of iron gives a precipitate which is neither soluble in ether or by heating. Lead acetate gives a precipitate.
 - a. Readily and completely soluble in ether alcohol.
 - c. Bromine solution precipitates the resin from the chloroform solution—Australian Copal.
 - d. Bromine solution produces no precipitate—Manilla Copal.
 - 2. Imperfectly soluble in ether-alcohol—East Indian Copal. African Copal.

2. The alcoholic solution gives with ammonia a turbid mixture.
 - a. Perchloride of iron gives a precipitate that is neither dissolved by boiling nor in ether—Borneo Copal.
 - b. Perchloride of iron gives no precipitate.
 - a. Completely soluble in ether-alcohol. Chloral test colors residue from evaporation of petroleum spirit extract blue to blue violet—Liquidambar styraciflua Balsam.
 - β. Incompletely soluble in ether-alcohol.
 - A. The drug contains sulphur.
 - c. Yields umbelliferon by dry distillation.
 - E. Hydrochloric acid colors the petroleum spirit extract residue reddish-yellow; the chloral test colors it green—Persian Sagapenum.
 - F. Hydrochloric acid colors the residue blue-violet; chloral test colors it rose color to raspberry-red and violet—Levant Sagapenum.
 - G. Not colored by hydrochloric acid. The solution of the drug in sulphuric acid is yellow brown with a blue fluorescence. Potassium nitrate colors the gum resin malachite-green—Ordinary Asafoetida.
 - D. Yields no umbelliferon by dry distillation.
 - E. Sodium carbonate solution colors the drug light brown, and the extract is not altered by acetic acid or lead acetate—Asafoetida from *Ferula alliacea*.
 - F. Sodium carbonate solution forms an emulsion that cannot be filtered.
 - H. Lead acetate gives no precipitate. Iodine solution is not altered—Indian Bdellium.
 - I. Lead acetate produces immediately or after a short time a precipitate that dissolves upon warming. Iodine solution is not altered—African Bdellium.
 - a. The drug contains no sulphur.
 - c. Yields umbelliferon by dry distillation.
 - E. The petroleum spirit extract residue is colored by hydrochloric acid and the chloral test.
 - H. Hydrochloric acid colors reddish-yellow; the chloral test colors green—Persian Galbanum.
 - I. Hydrochloric acid colors red-violet; the chloral test colors greenish—Levant Galbanum as at present in commerce.
 - K. Hydrochloric acid colors violet-blue; the chloral test carmine-red—Older specimens of Levant Galbanum.
 - F. Hydrochloric acid gives no color; the chloral test colors light brown—African Ammoniacum.
 - D. Yields no umbelliferon by dry distillation.
 - E. Chloride of lime solution colors the gum resin orange-yellow—Persian Ammoniacum.
 - F. Chloride of lime solution produces no color. Lead acetate gives no precipitate.
 - H. Iodine solution is not altered; the chloral test colors greenish—Olibanum.
 - I. Iodine solution is not altered; the chloral test gives no color—Indian Myrrh.
 - G. Chloride of lime solution produces no color. Lead acetate gives a precipitate.
 - H. Bromine solution colors violet-red; the chloral test colors violet—Ordinary Myrrh.
 - I. Bromine solution produces no color or only yellowish. Perchloride of iron colors green—Oponax.
 - K. Bromine solution produces no color or only yellowish. Perchloride of iron colors brownish—Euphorbium.

VARIETIES.

The specific gravity and strength of dialyzed iron has been determined by Mr. E. B. Shuttleworth with the following results:

Sp. gr.	Pulverulent on water-bath.	Well dried on water-bath.	Exposed during one night.	Calced.
1'046	. . .	5'6	. . .	5'0 per cent.
1'040	5'5	5'0	6'0	. . .
1'038	5'2	4'7	5'6	4'3
1'034	5'0	4'3

Taking into account the liability of strong and well dialyzed solutions to become gelatinous, I think a liquor of 1'040, yielding, when evaporated and well dried over a water-bath, 5 per cent. of residue, best fitted for medicinal use. Such a solution keeps well; it can be readily estimated by the pharmacist—a simple evaporating dish being all that is required—and, moreover, the strength corresponds as nearly as possible with that of the ordinary tincture of perchloride of iron.

A word in regard to the asserted tastelessness of dialyzed iron. I have now on hand a solution which has been dialyzing for 42 days, and is quite gelatinous; it cannot, however, be strictly described as tasteless. Though it is not in the least ferruginous, it is slightly styptic, and produces, when applied to the tongue, an effect similar to that of astringents. This is, I think, to be attributed to the precipitation of oxide, which occurs the moment the solution comes in contact with the saliva, thus giving rise to the sensation alluded to.

Provided, then, that a solution is deprived of ferruginous taste; that it is not distinctly *blackened* by infusion or tincture of galls, and does not give direct evidence of containing hydrochloric acid, I think the test of specific gravity may be, for common purposes, relied on.—*Canad. Phar. Jour.*, Dec., 1877.

Test for Elaterin. By David Lindo.—The active principle in elaterium affords a very beautiful reaction with carbolic acid and concentrated sulphuric acid. The test may be applied as follows:

Place a few crystals of elaterin in a small porcelain capsule, and add one or two drops of liquefied crystals of carbolic acid (Calvert's No. 1, liquefied by moisture). The elaterin dissolves in the carbolic acid without production of color, but if two or three drops of concentrated sulphuric acid are allowed to flow into the mixture, an intense and beautiful carmine color is developed, changing at first to orange and after some time to scarlet. Alkalies discharge the color. I have not been able to obtain a reaction resembling this with any of the alkaloids and carbolic acid, nor with any other substance tried.¹

If liquefied crystals of carbolic acid are not at hand, the solid crystals can be used. After adding them to the elaterin add a drop of chloroform or alcohol before apply-

¹If a nitrate in the *dry* state is treated in the same way with carbolic and sulphuric acids a deep green color is developed, which changes to red on the addition of a little water.

ing the sulphuric acid. The addition of sulphuric acid alone to elaterin gives rise to no characteristic color.¹ The elaterin cakes together, dissolves slowly and imparts a yellow color to the acid. If the carbolic acid is now added the reaction is obtained very imperfectly. The reagents should therefore be added in the order stated above. The test can be applied direct to some samples of the elaterium of commerce (dried sediment of the juice) if they are reduced to fine powder.

Other samples may require the powder to be agitated with chloroform, and the solution filtered. A few drops of the filtrate, evaporated to dryness by blowing on the surface, will afford a residue for testing.—*Chem. News*, Jan. 25.

Chrysophanic Acid in Skin Disease.—In a report of a case of psoriasis treated by chrysophanic acid, in the "Medical Press and Circular," by Dr. J. C. O. Will, of Aberdeen, he remarks :

The introduction of this new remedial agent, apparently possessing the power of effecting a cure in a short space of time, seems a real gain ; and if more extended trials are followed by equally beneficial effects, there is every reason to believe that chrysophanic acid will soon be regarded as the most reliable and quickest method of treating psoriasis.

It has one disadvantage, however, which renders its use rather objectionable in private practice, viz., that it stains the clothing of the patient and bed-clothes a purple color, which will not wash out ; but it may be reasonably expected that some means will be devised by which this may be overcome.

When prescribing chrysophanic acid, it is a wise precaution to warn the patient against allowing it to come in contact with the eyes, as it gives rise to intense irritation, accompanied by great dilatation of the pupils. This I have seen thrice—once in a case of psoriasis rupoides (at present under treatment), and twice in cases of favus, where I may mention that the acid proved useless. The irritation subsides spontaneously in the course of a few days.—*Med. and Surg. Reporter*, Jan. 12.

Carbazotate of Ammonium.—Dr. Beaumetz, of Paris, has reported, lately, six cases treated with this substance. Case 1. Quotidian ague ; recovery after four days' treatment ; daily dose, from one to two centigrams of the substance in pills. Case 2. Quotidian ague (sulphate of quinia having been given without effect): complete recovery after five days ; five pills used. Case 3. Tertian ague ; recovery after eight days ; two pills a day. Case 4. Quotidian ague ; recovery after eight days. Case 5. Facial neuralgia ; speedy recovery. Case 6. Tertian ague (sulphate of quinia has been administered during seventeen days with no result); completely cured after the administration of six centigrams (about one grain) of the salt for two days. Like quinia, carbazotate of ammonium diminishes the state of the pulse, and brings on heaviness, cephalalgia, and even delirium, and is eliminated by the kidneys. These experiments have again been repeated by Dr. Dujardin-Beaumetz, with similar results.—*Ibid.*, Jan. 5. See, also, *Amer. Jour. Phar.*, 1873, p. 221 and 232.

¹ See, however, "Am. Jour. Phar.," 1875, p. 2.—EDITOR.

Researches on Chloral and on its Hydrate. M. Berthelot.—There is liberation of heat in the reaction of gaseous chloral upon gaseous water with formation of a gaseous compound. The gaseous hydrate of chloral exists, then, veritably as a compound, distinct from a mere mixture of the two vapors. This conclusion is conformable to the results obtained by M. Troost from the study of the tensions of dissociation. It is supported by this fact that anhydrous chloral does not combine instantaneously with water, but condenses in it first in the form of an oil which only dissolves by degrees even on agitation; whilst, on the contrary, chloral hydrate in vapor condenses under water in the state of a crystalline hydrate, if not agitated, and dissolves at once on stirring.—*Chem. News* [Lond.], Jan. 11, 1878.

To Bronze Iron Articles.—According to a process by M. P. Hess, this is done by the articles being heated in the air after being coated with linseed oil. Objects which cannot be exposed to a high temperature may be steeped in a slightly acid solution of ferric chloride, plunged in hot water, and, when dry, rubbed with linseed oil or wax. To preserve iron from rust, the author recommends sulphide of copper. He steeps the iron for a few minutes in a solution of sulphate of copper, and then transfers it into a solution of hyposulphite of soda, acidulated with hydrochloric acid. The result is a blue-black coating, not affected by air or water.—*Ironmonger*, from *Am. Gas Light Jour.*, Jan. 2.

Ink that Cannot Be Erased.—An ink that cannot be erased, even with acids, is obtained by the following receipt: To good gall ink add a strong solution of fine soluble Prussian blue in distilled water. This addition makes the ink, which was previously proof against alkalies, equally proof against acids, and forms a writing fluid which cannot be erased without destruction of the paper. The ink writes greenish-blue, but afterwards turns black.—*Amer. Gas Light Jour.*, Jan. 2, 1878, from *Ironmonger*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, February 19, 1878.

In the absence of the President and Vice-President, Prof. Remington was called to the chair; the minutes of the last meeting were read and approved. The Chairman expressed the hope that if any strangers were present they would take part in the proceedings, and extended a cordial welcome to them.

Prof. Maisch presented, on behalf of our fellow-member Mr. Thomas H. Powers, a number of volumes, many of them rare, and portion from the library of the late Dr. Jno. Redman Coxe, formerly professor in the University of Pennsylvania, with a donation to cover the expense of rebinding such as needed it; the list of the volumes was read, and included the folio volume of the treatise on the "Natural order

of Melastomaceæ," by Humboldt and Bonpland, illustrated with fine steel plates beautifully colored.

Another donation of books, amounting to about forty, mostly treatises on chemistry in the German language, was also announced by Prof. Maisch as having been received from a scientific gentleman of this city who did not wish his name mentioned. The thanks of the College were directed to be returned to Mr. Powers, and to the donor of the other set through Prof. Maisch.

The annual report of the Smithsonian Institute, for 1876, was presented from the Secretary, Prof. Henry, through Prof. Maisch.

The following donations to the cabinet were received: From Mr. Neppach, a member of the present class, a specimen of *Barberry* or *Chittem Bark* from Oregon where it is used as a tonic and febrifuge; and from Mr. Jos. Jacobs, of Georgia, a specimen of the cotton plant (*Gossypium herbaceum*) with root, stem and the cotton balls in full development.

Mr. Ed. Gaillard read a paper upon Formic Acid (see page 115), and in answer to a question, stated that he had not learned the particular purpose for which the physician wanted the acid. Prof. Maisch called attention to the *spirit of ants*, officinal in the German and other European pharmacopœias, which is merely an alcoholic solution of formic acid, but is still prepared from red ants.

Prof. Maisch stated that he was experimenting on *Bromide of Iodine*, a substance which has long been in use among photographers, in the daguerreotype process for rendering the plates more sensitive, but appears to be likewise used, to some extent, for medicinal purposes; he described it as exceedingly caustic, similar to bromine, and as evidently unfit for internal use in the concentrated state, or in large doses. Recently, through a typographical error in a medical journal, it had been directed instead of potassium bromide in a prescription for epilepsy; the error had been promptly corrected, but it seemed proper to direct attention to the caustic nature of the compound.

Mr. Charles L. Mitchell read a paper upon medicated bougies (see page 108), giving their history and describing the various kinds in use, and the advantages of this method of medication; he exhibited specimens of the bougies as made by him, and also of Reynal's porte-remède, the former being more serviceable in appearance.

The Chairman called the attention of the meeting to the collections of one hundred and seventy specimens of North American drugs and preparations made from some of them, which the College had directed to be sent to the Paris Exposition, and after the close of that exhibition to be presented to the Société de Pharmacie of Paris. At the exhibition the collection will be in charge of Mr. Lindewald, a graduate of the College.

Attention was also called to the recent purchase made by the Board of Trustees of a large balance for scientific uses, especially valuable in enabling the members to have their weights and measures adjusted to the proper standard. An examination of the weights used in another city showed such discrepancies as to render it important that an examination of the weights used by the members of our profession should be instituted at once.

Mr. Shinn was called to the chair while Prof. Remington reported on a series of experiments undertaken by Mr. L. Wolff; having a considerable demand for the

albumen of eggs, he was desirous of utilizing the yolks, and this led to the preparation of the fixed oil contained in the latter and to an attempt of isolating the *emulsifying principle*, in which Mr. Wolff had been nearly successful. As obtained, the principle will readily emulsify oil in water by simple agitation.

The use of *fixed oils*, in pharmacy, was brought forward, and among others benne oil, obtained from the seed of the *Sesamum Orientale*, was mentioned as a remarkably bland oil. Prof. Maisch stated that the chief objection to it was, that, though not a drying oil proper, it gradually became thick and ropy on exposure, and could, therefore, not be advantageously substituted for expressed oil of almonds; a sample of cold cream made by using this oil in place of oil of almonds was exhibited by Mr. Mitchell, and was considered equal to that made by the official formula excepting in color. Prof. Maisch said that it was quite a question how much of the commercial expressed oil of almonds was really such, great quantities of apricot and peach kernels were annually consumed to obtain oil from them. The test recommended by Hager will detect the substitution: equal parts of 25 per cent. nitric acid and the oil are agitated and warmed to about 120°F., when almond oil will form a white emulsion-like mixture, the other oils mentioned turning yellow or pinkish (see also "Amer. Jour. Phar.," 1877, p. 595).

A sample of so-called California rock soap had been shown at the November meeting; since that time it has been subjected to a chemical investigation by Mr. Betz in the laboratory of the College, and proves to be a silicate of alumina with traces of calcium sulphate and iron, showing that it is a species of kaolin, and owes its deterrent qualities to its mechanical rather than chemical action.

Prof. Maisch showed specimens of drugs that had been presented to him, as being very beautiful, carefully prepared and of such superior quality as not often seen in the market; they were the root of *Archangelica officinalis*, the flowering herb of *Erythraea Centaurium*, or European Centaury, and Manna in very large, white flakes.

There being no further business, on motion, the meeting adjourned.

THOS. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The junior examination was held about the middle of February, 94 first course students participating. As in the preceding year, twelve specimens had been laid out for identification, and the same number of questions prepared to be answered in writing. The time allowed was five hours, of which fifteen minutes could be devoted to the examination of the specimens. The result was in the main satisfactory to the examiners. The following were the questions:

1. What is the chemical name of Chalk? State its composition and name the gas which is separated from it by the action of acids. Give the composition of this gas, its symbol, its physical and chemical properties and the method by which it may be detected.

2. What are the officinal names (U. S. P. and B. P.) of the solutions of Ammonia? Give the method of preparing them and explain the chemical changes which take place. State the relative strength and the specific gravity of each.

3. What forms of Sulphur are used in medicine? State their modes of preparation, the impurities they may contain, and the method of detection of the more common impurity.

4. Explain the meaning of the terms *root*, *rhizome*, *tuber* and *bulb*, and give two officinal examples of each.

5. What is a *berry*? A *drupe*? A *capsule*? Name several officinal examples of each kind.

6. Enumerate the officinal *leaves* which have the margin entire, and state which are of a leathery texture.

7. Define briefly the following pharmaceutical terms: Hydrometer, Elutriation, Conical Percolator, Infusion, Decoction, Fluid Extract, Cerate, Ointment, Plaster and Suppository.

8. Explain the following: Specific Gravity (of liquids), Trituration, Percolation, Distillation, Dialysis.

9. Explain the theory of the fermentation of Grain. Enumerate the various products used in Pharmacy in the order in which they are formed by this process, and give the Specific Gravity of the officinal liquids obtained by this kind of fermentation.

10. Give the officinal name, locality and natural order of the plant which furnishes Liquorice Root. What officinal product is made from the root, and how is it prepared? Name two officinal preparations into which this product enters.

11. State the officinal formula for the preparation of Magnesia. What change takes place during the process? What is its metallic base? Into what officinal solution does the carbonate enter? Give the formula and process for making this solution.

12. State how you would prepare this, and when prepared, would you dispense it?

R Acid: Arsenios: gr. xxxii
 Potassii Bicarb: gr. xxxii
 A Spirit: Lavand: Comp: f ʒss
 Aquæ Destillatæ, f ʒviiss

Signa: A teaspoonful to be taken every two hours.

What reaction will take place in the following prescription? Would you dispense it?

For T. Brown's Wife.

R Potassii Cyanid: gr. iv
 Syrup: Simp:
 B Syrup: Acidi Citrici, ad f ʒii

Signa: A teaspoonful to be given night and morning.

How would you prepare and dispense this prescription?

R Plumbi Acetat:
 C Zinci Sulphat: ad ʒii

Misce. Fiat chart: no: xii.

Add one powder to half pint of water and use as directed.

Alumni Association of the Massachusetts College of Pharmacy.—The regular meeting was held on the evening of Feb. 7, President Kelley in the chair.

Mr. Kelley called attention to an article called *Absorbent Cotton*, which had recently

made its appearance; he stated that both this and Dennison's jewelers' cotton were much superior to tow for straining solutions. The absorbed cotton sinks immediately on being thrown into water.

Mr. Kelley exhibited some samples of dialyzed and of recrystallized *salicylic acid*, the latter being the cheaper article, but the general opinion seemed to be that the former was handsomer.

Mr. Doliber exhibited a specimen of *Xanthium spinosum*, and the fluid extract of the same. This article had been introduced as a remedy for hydrophobia, but there are no cases of cure on record since its introduction. The drug possesses a strong odor and taste, and probably will prove useful for something.

Mr. Bartlett spoke of cosmolin, vaselin, dermolein, etc., and exhibited a preparation similar to these in nature and appearance. It is of the consistence of an ointment and can be made from Downer's heavy marine lubricating oils, which costs fifty cents per gallon, by mixing it with animal charcoal at 150°F., and then filtering in a jacketed funnel. (See, also, "*Amer. Jour. Phar.*," 1875, p. 257.) This led to conversation on animal charcoal. Mr. Doliber had seen some which contained considerable sulphur. Prof. Markoe thought it must have been previously used and partially restored.

Mr. Doliber spoke of an error which occurred in printing Dr. Brown-Sequard's prescription for epilepsy in the Boston "*Medical and Surgical Journal*," in an article written by Dr. Ayer. The second article in the prescription was "*iodidi bromidi*," and should have been *potassii bromidi*. The error was corrected in small type on the bottom of the last page of a subsequent number, but probably a great many had not seen it, as he had since received many orders for bromide of iodine.

The New York College of Pharmacy, we are pleased to learn, has purchased a building, hitherto used as a church, and conveniently and accessibly located. It is proposed to raise the roof and put in an additional floor, with the view of having two lecture rooms and a laboratory, besides other necessary rooms. The new building will probably be occupied about May 1st.

Pennsylvania Pharmaceutical Association.—In response to an invitation (p. 142) a number of leading druggists from different parts of the State assembled together in the rooms of the Pennsylvania State Agricultural Society, in Harrisburg, Feb. 26th, at 11 o'clock, for the purpose of organizing a State pharmaceutical association. There were present representatives from Philadelphia, Lancaster, Reading, Pottsville, Columbia, Chambersburg, Carlisle, Shippensburg and Harrisburg. The meeting was temporarily organized by the appointment of Charles A. Heinitch, of Lancaster, President, and John M. Maisch, of Philadelphia, Secretary. The morning session was occupied in the adoption of a constitution and by-laws.

After a recess of an hour for dinner the association reassembled at half-past two o'clock. The committee appointed at the close of the morning session to nominate permanent officers for the ensuing year, reported as follows:

President, Charles A. Heinitch. Vice-Presidents—Geo. W. Kennedy, Pottsville; Dr. W. H. Egle, Harrisburg. Secretary, J. A. Miller, Harrisburg. Assistant Sec-

retary, Jacob H. Stein, Reading. Treasurer, Joseph L. Lemberger, Lebanon. Executive Committee—Chas. H. Cressler, Chambersburg; W. F. Horn, Carlisle; J. A. Meyers, Columbia.

Various resolutions were adopted. The officers of the association were empowered to obtain a charter; a Committee on Pharmaceutical Legislation, consisting of Dr. W. H. Egle, Charles T. George and Dr. George Ross, was appointed, and the Secretary was authorized to send a circular to every druggist in the State explaining the objects of the organization and invite him to become a member. The association then adjourned to meet in Reading on the second Tuesday of June next. Those present at the meeting were very much gratified with the success of the movement, and expressed their belief that in a short time the association would embrace in its membership all the reputable pharmacists throughout the State.

Alumni Association of the Philadelphia College of Pharmacy.—The final meeting of the session was held February 7, 1878, President Mattison in the chair. In point of attendance it surpassed any previous one, over seventy persons being present. The minutes of the last meeting were read and approved. Mr. Kennedy gave the result of an assay of a sample of gun-powder which he had analyzed. He also gave the particulars of the case of poisoning by potassium chlorate, to which he alluded at a former meeting (see page 112). The President mentioned a case where the careless use of the troches of the substance had produced alarming symptoms.

Mr. Trimble read a paper prepared by Mr. Pennypacker, containing valuable information on the subject of the Salicylates (see page 114).

Mr. Betz reported an examination of the expressed oil of wild cherry pits, referred to him at an earlier meeting (see page 111).

Dr. Miller gave a resumé of some curious facts connected with Chinese and Mexican pharmacy, gathered from the respective exhibits of those countries at the Centennial. He also submitted a label for specimens, which, on being filled out, would state much information connected with the *Materia Medica* specimen on which it was employed. Samples of drugs, with the appropriate facts, were shown, and presented to the Alpha Phi Society. Highly aromatic oil of mace, obtained from mace by hydraulic expression, was brought to the notice of the meeting by the same gentleman.

The President showed a convenient and desirable little addition to the dispensing counter, in an apparatus for rapid filtration, which deserves to be generally adopted (see page 105). A paper on dialysis, explaining the meaning of the term, and process, was also read by Mr. Mattison (see page 102).

Mr. Sayre remarked on the use of dialyzed iron as an arsenical antidote, and the necessity of changing it into the form of a magma; also desired information on the subject of chrysophanic acid, which at present he is making from the East India goa-powder. Its use in certain skin diseases was adverted to.

The names of a number of specimens which had been submitted to the class for examination were then announced. They were very generally recognized by the students.

On motion the meeting adjourned.

WALLACE PROCTER, Sec'y.

EDITORIAL DEPARTMENT.

State Pharmaceutical Societies.—We are much pleased that our suggestion as to the advisability of calling a convention, with the view of organizing an association embracing all the reputable pharmacists and druggists of Pennsylvania, has been promptly acted upon, as will be noticed from the subjoined circular:

"Harrisburg, February 14, 1878. Dear Sir—You are hereby cordially invited to meet with us in this city on Tuesday, the 26th inst., at 11 A. M., in the rooms of the Pennsylvania Agricultural Society, for the purpose of organizing a State Pharmaceutical Association. Please extend the invitation to all druggists in good standing in your locality. Charles A. Heinisch, Lancaster; Geo. W. Kennedy, Pottsville; Joseph L. Lemberger, Lebanon; J. A. Miller, Wm. H. Egle, M.D., C. K. Keller, Chas. T. George, G. H. Markley, A. W. Nunemacker, J. H. Boher, Harrisburg."

As will be seen from the report on another page, the Association has been organized and is the second one in the Middle States, that of New Jersey being the first. We are aware that in others conferences have been held looking towards the same end, and we sincerely wish that they may likewise lead to the same desirable result.

Hospital Stewards, U. S. A.—The importance of securing for the armies the services of educated pharmacists is generally recognized in Europe, and in no country, perhaps, has this necessity been brought to such a state of perfection as in France, where there is ample chance given for promotion for services rendered, and where, as a natural consequence, many highly-educated pharmacists are found in responsible positions, and with a military rank commensurate to their responsibility. The medical service of the United States Army offers similar inducements to graduates in medicine, who before they are admitted as assistant-surgeons, have to submit to a thorough examination. It is different with the pharmacists of the army, the *hospital stewards* as they are now officially termed, or the *medical stewards* as they are proposed to be called hereafter. It is true that, previous to their appointment from the ranks of civil or military life, they must be recommended as being "temperate, honest, and in every way reliable, as well as sufficiently intelligent and skilled in pharmacy for the proper discharge of the responsible duties likely to devolve upon them;" but we regard it as a radical error, that they should not, like the surgeons, be required to have been specially educated to their calling. We are well aware that there are many pharmacists enlisted as hospital stewards, and the sooner it is recognized that the *best* pharmaceutical skill is not too good for the army, the better will it be for this special branch of the service, and the more readily will the army secure the services of well-educated pharmacists. A system of enlistment and promotion, similar to that of the French army, would secure this.

The hospital stewards of the army are now endeavoring to secure for themselves a well-recognized rank, and in this they should be successful. The demands to be recognized as sergeants and sergeant-majors, with an occasional promotion to the rank of lieutenant, are moderate enough, and, in our opinion, by far below their responsibilities and the duties required of them.

Curious Synonym for Quinia.—Recently we were shown a prescription in which the first article ordered was,

R Sulphatis americanæ australis, gr. xxiv.

This *South American sulphate* was interpreted to mean quinia sulphate, the former term having been probably selected by the physician because, from a fancied idiosyncrasy or dreaded ill-effects, the patient imagined to be unable or refused to take quinia.

Prescription Blanks and the Percentage Business.—We have occasionally referred to the nefarious collusion between some physicians and apothecaries, by which the patient is made to pay extortionate prices so that the attending physician may, besides his regular fee, secure some additional cash through the apothecary. On various occasions we have alluded to these corrupt bargains, and we are prompted to again refer to them by having seen a prescription blank, upon the back of which is printed the following notice:

"N. B.—In justice to myself and the profession, attention is called to the fact that the physician who writes upon this blank does not accept percentage from the apothecary."

We are not aware to what extent the practice prevails, or is by the public supposed to prevail in the community where the blank before us originated; but for the honor of both professions we trust that the honorable physicians and pharmacists, who would spurn such collusion, are vastly in the majority, and do not form the exception.

The Prolificness of Stramonium.—Some time ago, Mr. Theodore G. Davis informed us that last year he had chosen a plant of *Datura stramonium* with the intention of collecting its leaves and seeds. The plant, however, was destroyed by a storm in September, at which time it had attained a height of four and a half feet, and with its branches spread over an area five feet in diameter. It had produced 125 flowers and capsules; each capsule contained between 700 and 735 seeds, and as it takes between 9 and 10 seeds to weigh one grain, the plant would have produced nearly 20 troyounces of seeds, if all had ripened.

The Necessity of Forest Culture.—We find it stated that in ten years there have been destroyed in the United States not less than 12,000,000 acres of forest trees. We do not know how accurate this estimate may be, but it must be evident to all observing travelers that in many localities forests are ruthlessly destroyed for the sake of the timber, and without making any endeavor of replanting them. The important influence of forests upon the climate is well known and generally admitted, and with such a wholesale clearing of timber land as above indicated, must soon impress upon all the necessity of rational forest culture, which, up to this time, has been almost completely neglected.

OBITUARY.

PAUL ANTOINE CAP died November 12, 1877, at the advanced age of 90 years. He was a prominent pharmacien at Paris and the author of an elementary work on pharmacy and of numerous essays on pharmaceutical subjects, a number of which were transferred to the earlier volumes of the "American Journal of Pharmacy" up to the year 1865. The deceased was a corresponding member of the Philadelphia College of Pharmacy.

NAPOLÉON NICKLÈS, pharmacist at Benfeld, Alsace-Lorraine, died there January 6, aged 69 years. The deceased was born Oct. 23, 1808, became an apprentice in January, 1822, and subsequently served as clerk at Strasburg and other towns of Alsace-Lorraine. He graduated at Strasburg in 1833, and in the following year established himself at Benfeld, where he continued to cultivate his favorite study of botany. His scientific attainments were recognized by many French and German societies, in electing him honorary or corresponding member. He was the author of several works on botanical and agricultural subjects, and a contributor to the "Journal de Pharmacie d'Alsace-Lorraine."

HENRY DANIEL RUHMKORFF, the famous magneto-electrician, died at Paris Dec. 20, 1877, in the seventy-fifth year of his age. He was born at Hannover, Germany, but, while a youth, came to Paris, where, in 1844, he attracted attention by a new thermo-electric battery, and in 1851 constructed the apparatus known everywhere as Ruhmkorff's apparatus. In 1855 he was awarded the first prize of 50,000 francs for the excellence of his electric apparatus.

ANTOINE CÉSAR BECQUEREL was born March 8, 1788, at Chatillon sur Loing, Department of Loire, and received his scientific education at the Paris Polytechnic School. After having served in the army until 1815, he devoted himself to his favorite branch of science, physics, and more especially to magnetism and electricity in their application to the arts and sciences. One of the fruits of these investigations was his well known work, *Electrochimie appliquée aux arts*, which appeared in 1842. A number of his essays have appeared in the earlier volumes of this journal. He labored for a long time as professor of physics at the Jardin des Plantes, and was a member of the Academy of Sciences since 1824, and of many learned societies. He died January 18, having nearly completed his ninetieth year.

VICTOR HENRI REGNAULT, another eminent scientist of France, died at Paris, January 19, at the age of 67½ years. He was born at Aix-la-Chapelle in 1810, finished his scientific education at the Paris Polytechnic College, occupied afterwards the chair of physics and chemistry at Lyons, and was then called to Paris, first to the Polytechnic School, and in 1841 to the Collège de France. Since 1854 he was director of the porcelain manufactory at Sèvres. The most important researches of the deceased were on the expansion, compression and density of gases and liquids, on the latent heat of vapors, on the specific heat of bodies, etc. A few of his papers, having some bearing on pharmacy, will be found, in abstract, in former volumes of this journal.